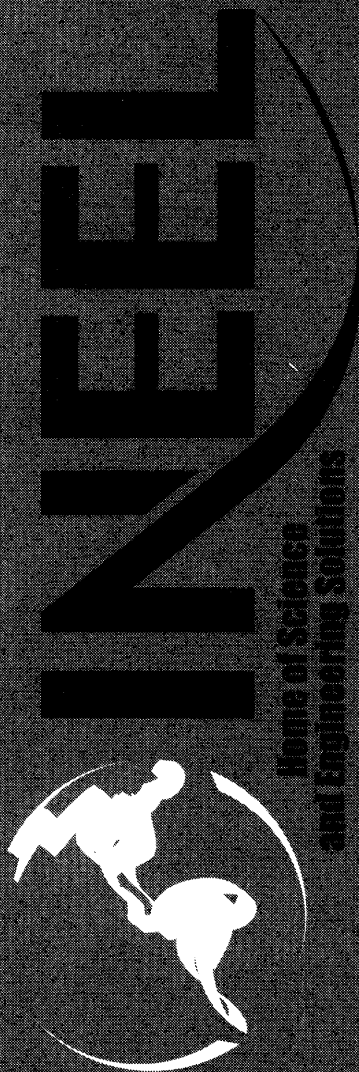


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Revision 1

April 2001

Health and Safety Plan for Waste Area Group 3, Operable Unit 3-13, Group 1 Soils Tank Farm Interim Action



**Health and Safety Plan for Waste Area Group 3,
Operable Unit 3-13, Group 1 Soils Tank Farm Interim
Action**

Published April 2001

**Idaho National Engineering and Environmental Laboratory
Environmental Restoration Directorate
Idaho Falls, Idaho 83415**

**Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Restoration
Under DOE Idaho Operations Office
Contract DE-AC07-99ID13727**

ABSTRACT

This health and safety plan establishes the procedures and requirements that will be used to eliminate or minimize health and safety risks to personnel at the Waste Area Group 3, Operable Unit 3-13, Group 1 Soils Tank Farm Interim Action project. This health and safety plan follows the requirements of the Occupational Safety and Health Administration standard, 29 Code of Federal Regulations 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response." It contains information about the hazards involved in performing the work, and the specific actions and equipment that will be used to protect personnel at the project location. This plan has been prepared to comply with the authorized safety basis at the Idaho Nuclear Technology and Engineering Center as defined by the U.S. Department of Energy Order 5480.23.

This health and safety plan contains the safety, health, and radiological hazard assessment for conducting all Waste Area Group 3, Operable Unit 3-13, Group 1 Soils Tank Farm Interim Action tasks. The intent of this document is to identify known hazards and to serve as a plan for mitigating them. Safety and health professionals supporting these activities must determine the most appropriate hazard control and mitigation measures based on project-specific conditions and should make changes to this document as appropriate.

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AL	action level
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
Anti-C	Anti-contamination
APR	air-purifying respirator
ARDC	Administrative Record and Document Control
BBWI	Bechtel BWXT Idaho, LLC
CAM	continuous air monitor
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CNS	central nervous system
CRC	contamination reduction corridor
CRZ	contamination reduction zone
CVS	cardiovascular system
DAR	data analysis report
D&D&D	deactivation, decontamination, and dismantlement
dBA	decibel A-weighted
DOE	Department of Energy
DOE-ID	DOE Idaho Operations Office
EA	exposure assessment

EAM	emergency action manager
EC	emergency coordinator
EO	environmental operations
EPA	Environmental Protection Agency
ER	environmental restoration
ERO	Emergency Response Organization
ERP	Environmental Restoration Program
ESH&QA	environmental, safety, and health/quality assurance
EZ	exclusion zone
FD	fire department
FFA/CO	Federal Facility Agreement and Consent Order
FTL	field team leader
GM	Geiger-Mueller
GI	gastrointestinal
HASP	health and safety plan
HASS	Hazards Assessment and Sampling System
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	high efficiency particulate air
HSO	health and safety officer
ICS	Incident Command System
IDLH	immediately dangerous to life or health
IDW	investigation derived waste
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IRT	Incident Response Team

IRTL	Incident Response Team Leader
ISM	Integrated Safety Management
JSA	job safety analysis
JSS	job site supervisor
LLW	low-level waste
LMITCO	Lockheed Martin Idaho Technologies Company
MCP	management control procedure
MSDS	material safety data sheet
NEPA	National Environmental Policy Act
NIOSH	National Institute of Occupational Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
ORB	Operational Review Board
OSC	On-Scene Commander
OSHA	Occupational Safety and Health Administration
PCM	personnel contamination monitor
PEL	permissible exposure limit
PE	project engineer
PID	photo-ionization detector
PM	project manager
POC	point of contact
POD	plan of the day
PPE	personal protective equipment
PRD	program requirements document
QAPjP	quality assurance project plan
RadCon	radiological control

RAM	remote area monitor
RBA	radiological buffer area
RCIMS	Radiological Control and Information Management System
RCM	radiological control manual
RCT	radiological control technician
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RE	radiological engineer
REM	roentgen equivalent man
RMA	radioactive material area
ROD	Record of Decision
RWP	radiological work permit
SAR	supplied air respirator
SCBA	self-contained breathing apparatus
SDA	subsurface disposal area
SE	safety engineer
SHPO	state historic preservation officer
SH&Q	safety, health, and quality
SRPA	Snake River Plain Aquifer
SS	shift supervisor
STEL	short-term exposure limit
STR	subcontractor technical representative
SWP	safe work permit
SZ	support zone
TFIA	tank farm interim action
TLD	thermoluminescent dosimeter

TLV	threshold-limit value
TPR	technical procedure
TRU	transuranic
TWA	time weighted average
U.S.	United States
USCG	United States Coast Guard
USQ	unreviewed safety question
VOC	volatile organic compound
VPP	Voluntary Protection Program
WAC	waste acceptance criteria
WAG	waste area group
WCC	Warning Communications Center

Health and Safety Plan for Waste Area Group 3, Operable Unit 3-13, Group 1 Soils Tank Farm Interim Action

1. INTRODUCTION

This health and safety plan (HASP) establishes the procedures and requirements that will be used to eliminate and/or minimize health and safety risks to people working at the Waste Area Group (WAG 3), Operable Unit (OU) 3-13, Group 1 Soils Tank Farm Interim Action. This HASP meets the requirements of the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response (HAZWOPER)." Its preparation is consistent with information found in the National Institute of Occupational Safety and Health (NIOSH)/OSHA/United States Coast Guard (USCG)/U.S. Environmental Protection Agency (EPA) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985); Bechtel BWXT Idaho, LLC (BBWI) *Safety and Health Manuals*; and Idaho National Engineering and Environmental Laboratory (INEEL) *Radiological Controls Manual* and *Radiation Protection Manual*. This HASP complies with the authorized safety basis detailed in the Idaho Nuclear Technology and Engineering Center (INTEC) safety authorization basis (safety analysis report) as defined in the U.S. Department of Energy (DOE) Order 5480.23, using the unreviewed safety question (USQ) process.

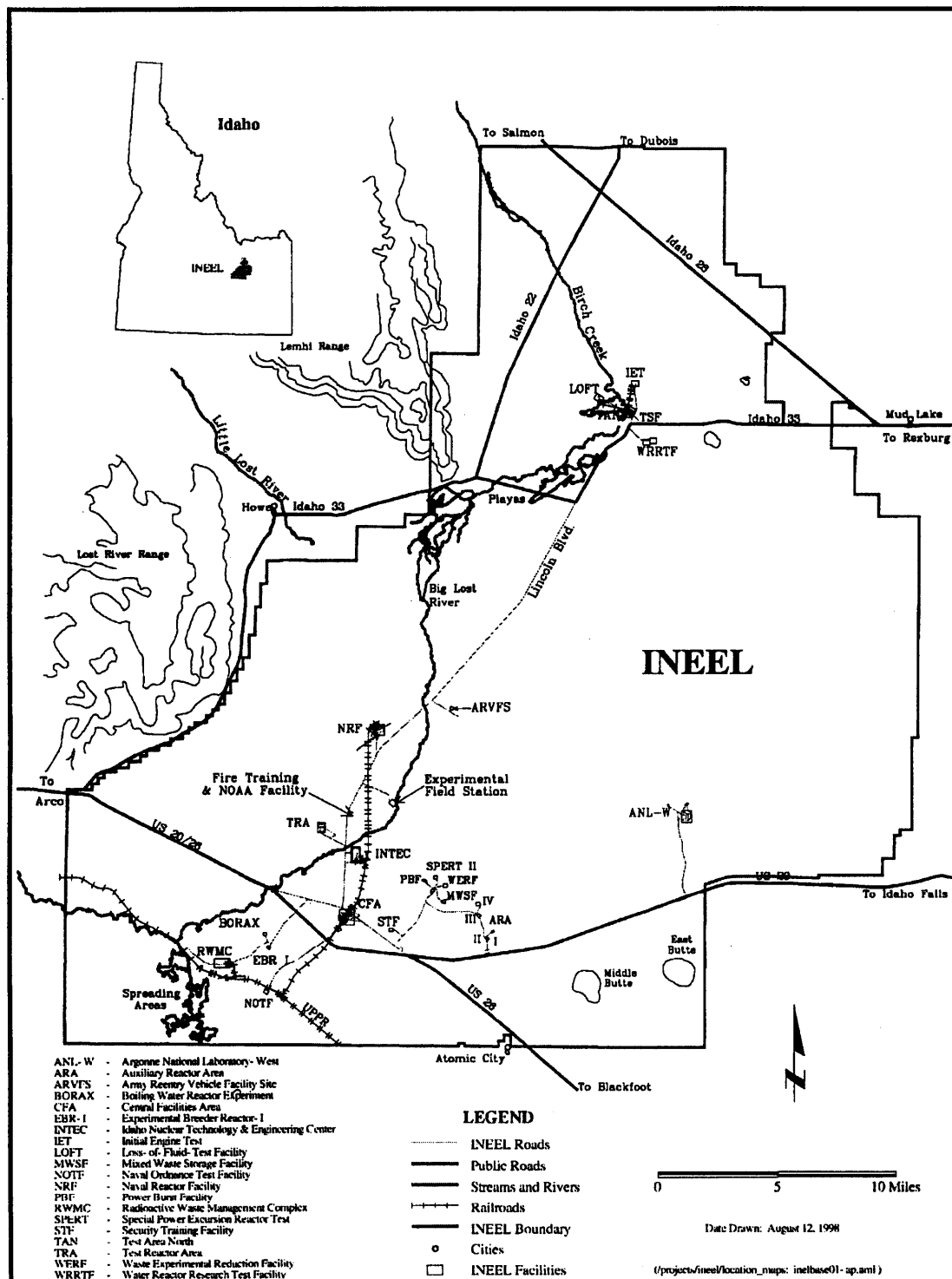
This HASP governs all work at the WAG 3, OU 3-13 Soils Tank Farm Interim Action project that is performed by employees of BBWI, subcontractors to BBWI, and employees of other companies, or the United States Department of Energy (DOE) laboratories. People not normally assigned to work at the project, such as representatives of DOE, the state of Idaho, OSHA, and the EPA are considered visitors who fall under the definition of "occasional site workers" as stated in OSHA 29 CFR 1910.120/1926.65.

This HASP will be reviewed and revised annually per the management control procedure, *Hazardous Waste, Operations & Emergency Response* (MCP-255), to ensure compliance by the health and safety officer (HSO), the field team leader (FTL), necessary environmental, safety, and health professionals, and the Environmental Restoration (ER) WAG 3 safety, health, and quality assurance (SH&Q) compliance officer.

1.1 INEEL Site Description

The INEEL, formerly the Idaho National Engineering Laboratory (INEL) and the National Reactor Testing Station (NRTS), encompasses 2,305 km² (890 mi²), being located approximately 55 km (34 mi) west of Idaho Falls, Idaho (see Figure 1-1).

The United States Atomic Energy Commission, now the DOE, established the NRTS, now the INEEL, in 1949 as a site for building and testing a variety of nuclear facilities. The INEEL has also been the storage facility for transuranic (TRU) radionuclides and radioactive low-level waste (LLW) since 1952. At present, the INEEL supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management technology development, and energy technology and conservation programs. The DOE Idaho Operations Office (DOE-ID) has responsibility for the INEEL and designates authority to operate the INEEL to government contractors.



Bechtel BWXT Idaho, LLC, the current primary contractor for DOE-ID at the INEEL, provides managing and operating services to the majority of INEEL facilities.

1.2 Site Description

The INTEC, formerly known as the Idaho Chemical Processing Plant (ICPP), is located in the south-central area of the INEEL in southeastern Idaho. Operations at INTEC since 1952 have primarily been related to the reprocessing of spent nuclear fuel from defense projects wherein reusable uranium was extracted from the spent fuels. The DOE discontinued reprocessing at the facility in 1992. Liquid waste generated from the activities prior to 1992 is stored in an underground tank farm. Treatment of this waste using a calcining process is ongoing at the facility. This process converts the liquid to a more stable granular form; the calcined solids are then stored in stainless steel bins. Disposition of this waste will be addressed in the "INEEL High Level Waste and Facility Disposition Environmental Impact Statement." The current mission for the INTEC is to receive and temporarily store spent nuclear fuel and radioactive waste for future disposition, manage waste, and perform remedial actions.

Both soil and groundwater contamination (see Table 1-1 for potential INTEC radionuclide contaminants) resulted from previous operations at INTEC. Under the Federal Facility Agreement and Consent Order (FFA/CO), the EPA, Idaho Department of Health and Welfare (IDHW), and DOE (herein referred to as the Agencies) are directing cleanup activities to reduce human health and environmental risks to acceptable levels. Under the FFA/CO, the INEEL was divided into 10 WAGs to facilitate the cleanup activities. The INTEC is designated as WAG 3. Within WAG 3, the facility was further divided into OUs made up of individual contaminant release sites.

Several phases of investigation have been performed on the various OUs within WAG 3. A comprehensive remedial investigation/feasibility study (RI/FS) (OU 3-13 RI/FS) was conducted to determine the nature and extent of contamination and corresponding potential risks to human health and the environment under various exposure pathways and scenarios. On the basis of the RI/FS, the INTEC release sites were further segregated into seven groups to allow the development and analysis of remedial action alternatives with the sites grouped by contaminants of concern (COC), accessibility, or geographic proximity.

For each of the seven groups, remedial action alternatives were developed and evaluated in the OU 3-13 Feasibility Study (FS) and FS Supplement Reports. Detailed information on the release sites within each group can be found in the *Comprehensive RI/FS for the Idaho Chemical Processing Plant at the INEEL Part A-RI/BRA Report, Part B—FS and FS Supplement Reports* along with the *Record of Decision for the Idaho Nuclear Technology and Engineering Center OU 3-13 at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1997a, DOE-ID 1997b, DOE-ID 1998a, and DOE-ID 1999). Based on the results of the alternative evaluation in the FS and FS Supplement Reports, a remedial alternative was preferred for each group of sites. The preferred alternatives were presented in the Proposed Plan for OU 3-13 (DOE-ID 1998b). This HASP addresses only the Group 1 Soil sites.

The OU 3-13 Group 1 Soils, are soils at the Idaho Nuclear Technology and Engineering Center (INTEC) within the tank farm fence in addition to soils within a 150 ft zone surrounding the tank farm. There are several buildings surrounding the tank farm, so the perimeter boundary line is not necessarily drawn exactly at the 150 ft mark. The area within the fence is approximately 200,000 ft² (4.60 acres) and the area within the 150 ft perimeter zone is approximately 160,000 ft² (3.7 acres).

Table 1-1. Potential INTEC radionuclide contaminants and suspected maximum concentrations.^a

Radionuclide Contaminants	Background Surface Soil (0–10 cm bls)	Maximum Concentration Term (pCi/g)
	95%–95% Upper Tolerance Limit (pCi/g)	
Am-241	0.011	3.27
Cs-134	NR ^b	1,450
Cs-137	0.82	21,000
Co-57 ^{b,c}	NR	1.02
Co-60	NR	2,390
Eu-152	NR	35,000
Eu-154	NR	35,000
Eu-155	NR	7,600
Pu-238	0.0005	3.6
Pu-239/240	0.10	12.0
Pu-241	NR	NA ^d
Sr-90	0.49	15,800
Np-237	NR	0.15
U-234	1.44	2.2
U-235	NR	0.039
U-238	1.4	1.7
Ce-144	NR	2,390

a. This table has been extracted from the *Health and Safety Plan for the INTEC Radionuclide Contaminated Soils Removal Action* (INEL/EXT-97-00132, Revision 3, August 1999).

b. NR = No background data were available to calculate a background value.

c. The half-life for Co-57 is 270.9 days; therefore, any risk due to the presence of this isotope would be minimal.

d. NA = Not applicable.

1.3 Scope of Work Group 1 Soils Tank Farm Interim Action

The principal threat associated with the tank farm soils are due to direct or potential radiation exposure (see Table 1-1, Sections 8.1, and 8.3.2.2) to workers or the public; and, due to potential leaching and transport of contaminants, to the perched water or the Snake River Plane Aquifer (SRPA), a sole source aquifer. A final remedy for the tank farm soils release sites has been deferred pending further characterization and coordination of any proposed remedial actions with the "Idaho High Level Waste and Facilities Disposition Environmental Impact Statement," currently in preparation. A separate RI/FS, Proposed Plan, and ROD will be prepared for the tank farm soils under OU 3-14. Interim actions were evaluated to provide protection until a final remedy is developed and implemented. The selected Tank Farm Soils Interim Action is Institutional Controls with Surface Water Control.

The specific remedial action goals are

- Restrict access to control exposure to workers and prevent exposure to the public from soils at the Tank Farm until implementation of the final remedy under OU 3-14 ROD
- Accommodate a 1 in 25-year, 24-hour storm event with surface water run-on diversion channels
- Minimize precipitation infiltration by grading and surface sealing the Tank Farm Soils sufficient to divert 80% of the average annual precipitation falling on the Tank Farm Soils area, and
- Improve exterior building drainage to direct water away from the contaminated areas, as promulgated in the OU 3-13 Final Record of Decision.

The interim action remedial action tasks include the following:

- Selected storm water collection ditches around the tank farm and out to the discharge point will be graded and lined with concrete.
- Selected culverts around the tank farm and out to the discharge point will be replaced with larger culverts to accommodate the expected increase in storm water flow. The depth of the excavations shall require shoring for safety purposes and reduced impact to the surrounding operating areas.
- A lift-station and associated manholes shall be constructed at the intersection of Beech and Olive Avenue to pump storm water to a location where it will drain freely to the discharge point. The depth of the excavation shall be approximately 15 feet and constitute confined workspace environment.
- Concrete headwalls and endwalls will be constructed as necessary throughout the lined drainage system.
- A lined storm water collection pond will be constructed, outside of the INTEC fence, to collect storm water runoff from the tank farm and other INTEC areas that currently drain into CERCLA Environmentally Controlled Area (ECA) 37A. The pond will be located approximately 400-ft south of the existing sewage treatment plant and 300-ft north of building CPP-698. The pond will be lined with 60-mil high-density polyethylene and will be approximately 15 ft deep, with bottom dimensions approximately 160-ft x 340-ft. All drainage ditches within the scope of this project will be routed to the pond.
- A new fence will be constructed around the storm water collection pond.
- An impervious covering will be applied over all the open ground within the Tank Farm Interim Action perimeter to minimize storm water infiltration into the underlying soils. A geotextile material will be placed on the ground, and a polyurea spray-on liner will be applied over the geotextile material. Before doing this, the ground surface will be graded to create drainage away from the tank farm and into the stormwater collection system. To evaluate the effectiveness of the polyurea product, a demonstration will be performed north of the tank farm. This demonstration will be conducted in ECAs 14, 26 and 88.

- Two concrete-lined ditches (approximately 1.5 ft deep x 7.5 ft wide) will be constructed within the tank farm to collect and direct precipitation run-off to the surrounding storm water collection system.
- High vehicle traffic areas within the tank farm will be paved as necessary.
- Approximately 40,000 cubic yards of soil will be excavated during this project. The majority (greater than 80%) of the excavated soil will be generated during construction of the evaporation pond, located outside the INTEC fence. The smaller portion of the excavated soil will be generated inside the facility during grading for ditch upgrades, installation of the lift station and minor grading to be conducted prior to applying the polyurea liner within and around the tank farm. All excess soil generated inside the INTEC facility will be used as fill for grading and backfilling excavations inside the facility. If necessary, clean soil from the evaporation pond excavation will be used as added fill inside the INTEC facility. The majority of the soil from the evaporation pond excavation will be stockpiled within the Area Of Contamination, but outside the INTEC facility fence near the new location of the Staging, Storage, Stabilization, and Treatment Facility (SSSTF) for future fill material required for the SSSTF construction. All disturbed soil will be controlled and managed according to the Waste Management Plan provided in the RD/RA Work Plan for the OU 3-13 Group 1 Tank Farm Interim Action.
- Unidentified CERCLA wastes may be encountered during excavation work. These materials may be identified through sampling activities, traced to their origin or source, controlled to stop leaks, and placed in appropriate containers for proper on-Site or off-Site disposal.

Surveillance and monitoring tasks will commence after the construction activities are completed and the overall system is operational. It is anticipated that by 2007 surveillance and monitoring activities will be addressed and managed under the OU 3-14 ROD. Surveillance activities are intended to assure the interim actions are functioning adequately to meet the remedial action objectives stated in the OU 3-13 ROD and discussed above. Activities shall include routine inspections of the liner and drainage systems, and monitoring of the evaporation pond liner integrity. Standard maintenance and operating procedures shall be integrated into the INTEC documentation to provide proper maintenance during and after future operations or construction activities within the TFIA area. Continuous system ownership shall be controlled by WAG 3 management.

Environmental Restoration and INTEC ESH&QA professionals have assisted in completing the Hazards Screening Profile checklist found in STD-101 ("Integrated Work Control Process"), and the "Hazards Identification and Control for Operational Activity," prior to work being performed.

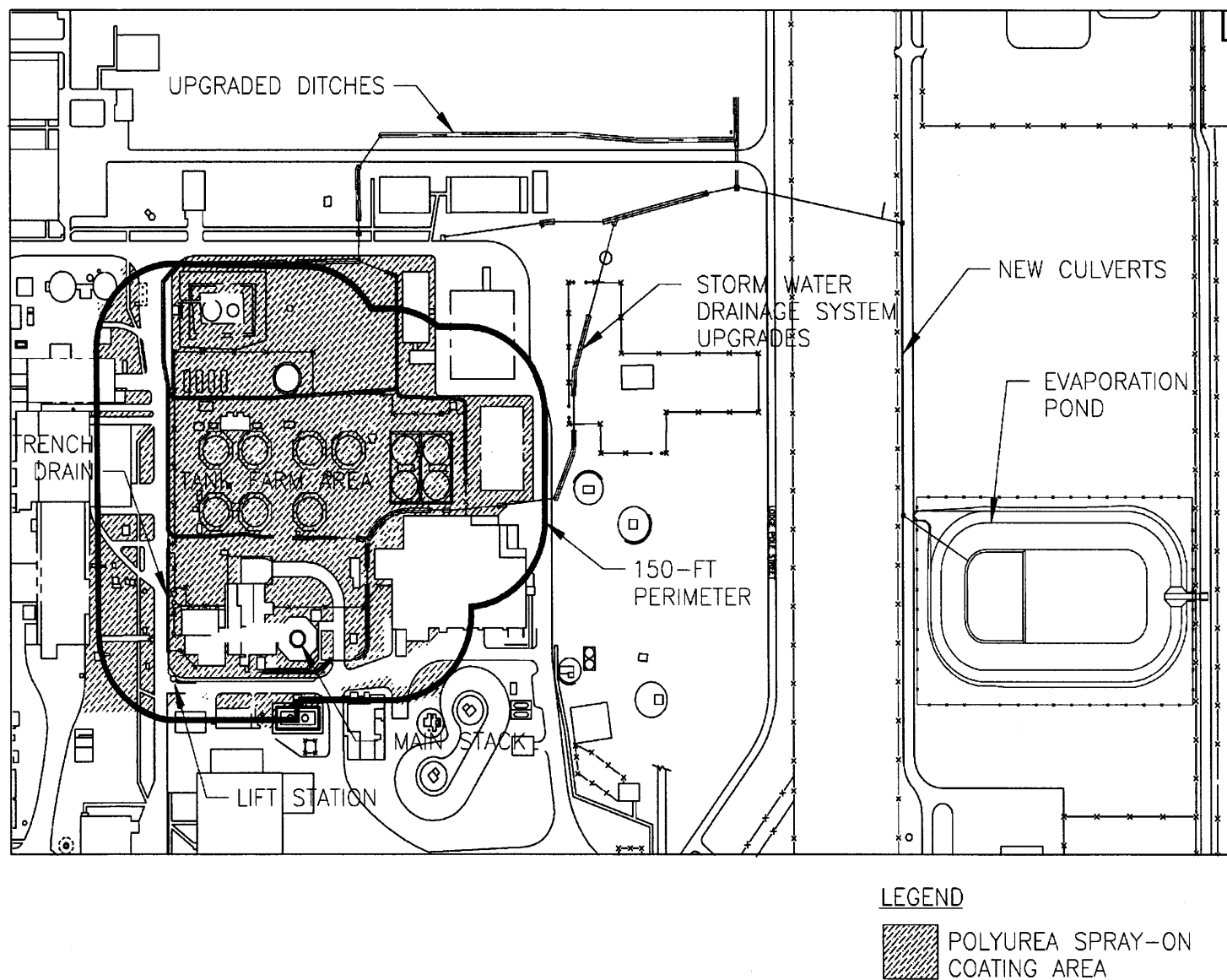


Figure 1-2. Location of WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action.

2. KEY PROJECT PERSONNEL RESPONSIBILITIES

The organizational structure for this project reflects the resources and expertise needed to perform the work, while minimizing risks to worker health and safety, the environment, and the general public. The titles of the individuals in key roles at the project, and lines of responsibility and communication, are shown on the organizational chart for the project (Figure 2-1). The following sections outline the responsibilities of key project personnel.

2.1 Environmental Restoration Director

The BBWI ER director has the ultimate responsibility for the technical quality of all projects, maintaining a safe environment, and the safety and health of all personnel during field activities performed by or for Environmental Restoration. The ER director provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ER director ensures the following:

- Project/program activities are conducted according to all applicable federal, state, local, and company requirements and agreements.
- Program budgets and schedules are approved and monitored to be within budgetary guidelines.
- Personnel, equipment, subcontractors, and services are available.
- Direction is provided for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.
- The ER director will ensure the Operational Review Board (ORB) conducts a review of the activities in accordance with STD-101 or MCP-3562 prior to commencing work activities.

2.2 ER WAG 3 Safety, Health and Quality Point of Contact

The ER WAG 3 safety, health, and quality (SH&Q) point of contact (POC), or designee, is responsible to manage SH&Q resources to ensure that SH&Q programs, policies, standards, procedures, and mandatory requirements are planned, scheduled, implemented and executed in the WAG 3 day-to-day operations. The SH&Q POC directs the SH&Q compliance activities by providing technical and administrative direction to project staff and through coordination with related INTEC SH&Q functional entities. The ER WAG 3 SH&Q POC reports directly to the WAG 3 manager. Under the direction of the WAG 3 manager, the WAG 3 SH&Q POC represents the WAG in all SH&Q matters. This includes assisting the WAG 3 manager in being responsible for WAG 3 SH&Q compliance and oversight for Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) operations planned and conducted at the Idaho Nuclear Technology and Engineering Center (INTEC).

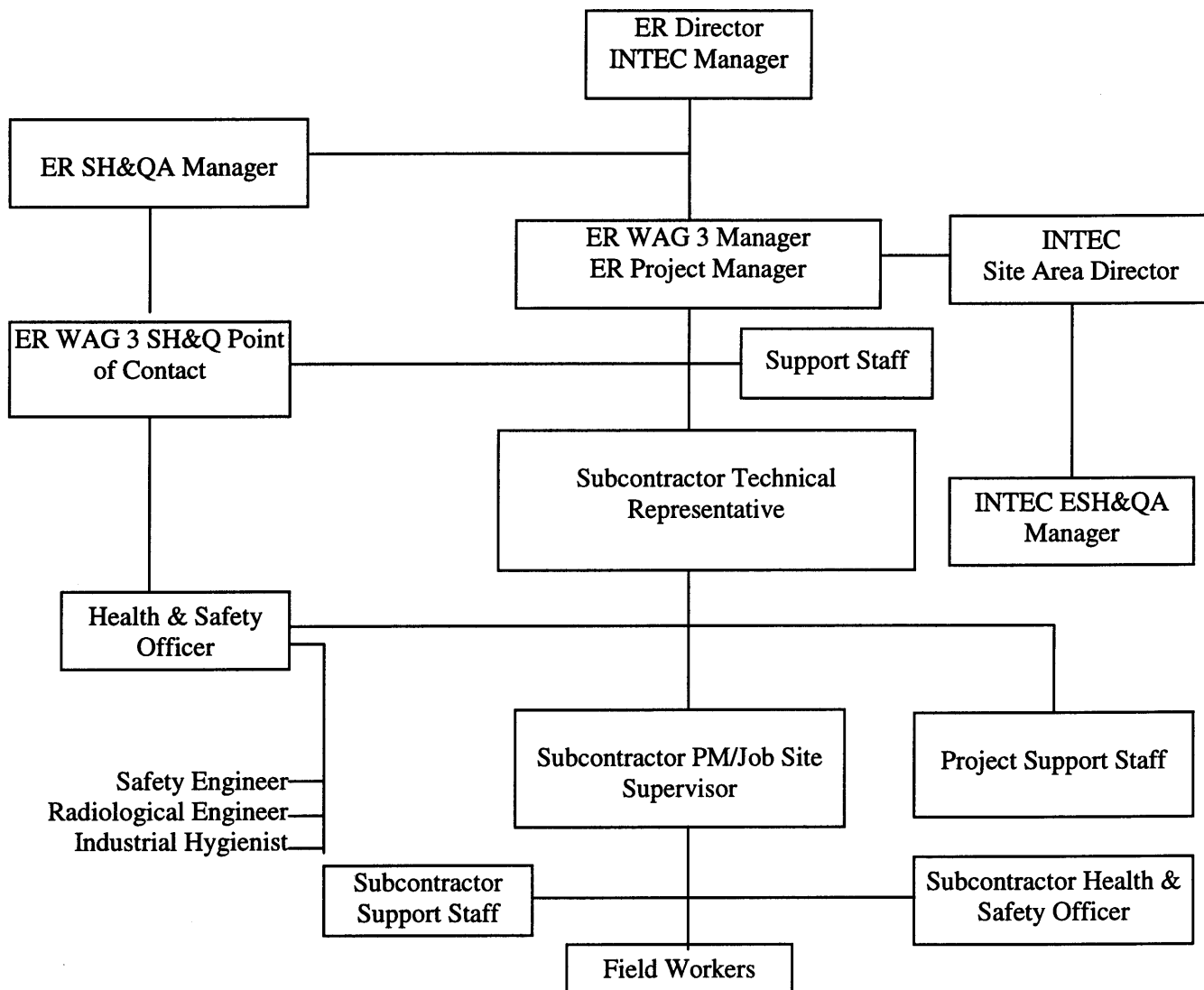


Figure 2-1. Field organization chart for the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action.

The ER WAG 3 SH&Q POC is responsible for ensuring that projects have the following technical disciplines and implementation of the programs related to these disciplines assigned to the projects:

- Radiological controls (RadCon) personnel
- Industrial safety personnel
- Fire protection personnel
- Quality assurance personnel
- Industrial hygiene (IH) personnel
- Emergency preparedness personnel

2.3 Project Manager

The project manager (PM) shall ensure that all activities conducted during the project comply with Company MCPs and program requirements documents (PRDs); all applicable OSHA, EPA, DOE, U.S. Department of Transportation (DOT), and State of Idaho requirements; and that tasks comply with the *Implementation Project Management Plan for the Idaho National Engineering and Environmental laboratory Remediation Program* (INEEL 1998), the quality assurance project plan (QAPjP) (DOE-ID 1997a), and this HASP.

The PM is responsible for the overall work scope, schedule, and budget. The PM will ensure that an Employee Job Function Evaluation (Form 340.02) is completed for all project employees, reviewed by the project IH for validation, and then submitted to the Occupational Medical Program (OMP) for determination of whether a medical evaluation is necessary.

2.4 Subcontractor Technical Representative

The Subcontractor Technical Representative (STR) is responsible for field implementation of the project. This responsibility involves ensuring that all tasks receive appropriate health and safety review before commencement, and that the necessary equipment and facilities are made available to implement the provisions of this plan. Additionally, the STR or PE will serve as the primary interface with subcontractor personnel at the project.

2.5 Project Engineer

The project engineer (PE) is the individual with ultimate responsibility for the safe and successful completion of assigned project tasks. The PE manages field operations and executes the work plan, enforces project control and documents project activities, and may conduct the daily pre-job safety briefings at the start of the shift. Health and safety issues at the project must be brought to the STR/PE's attention.

If the PE leaves the project, an alternate individual will be appointed to act as the PE. People acting as PE on the project must meet all PE training requirements outlined in Section 4 of this HASP. The identity of the acting PE shall be conveyed to project personnel, recorded in the PE daily force report, and communicated to the facility representative when appropriate.

If the nature of the fieldwork requires involvement or field team staffing by equipment operators, laborers, or other crafts, a representative from the organization supplying these additional resources will interface with the PE to provide work supervision. This person may be designated the job-site supervisor (JSS). Additionally, the STR or PE will serve as the primary interface with subcontractor personnel at the project.

2.6 Subcontractor Job Site Supervisor

A subcontractor job site supervisor (JSS) will accomplish some of the logging tasks during the project. The subcontractor JSS serves as the subcontractor safety representative at the project. The subcontractor JSS may also serve as the subcontractor PM. The subcontractor JSS is the subcontractor field supervisor for subcontractor personnel assigned to work at the project. The subcontractor JSS and PE work as a team to accomplish day-to-day operations at the project, identify and obtain additional resources needed at the project, and interact with the HSO, IH, SE, RE, and RCT on matters regarding health and safety. The JSS, like the PE, must be informed about any health and safety issues that arise at the project and may stop work at the project if an unsafe condition exists. The subcontractor JSS will provide information to the PE regarding the nature of their work for input at the daily pre-job briefing.

2.7 Support Staff

Support staff consist of various project, and subcontractor staff (as applicable) that are necessary to ensure the smooth operation of the project. This includes supplementary project management assistance, secretarial/administrative assistance, technical editing, ER Independent Review, other engineering support, or any other support necessary for the successful completion of the project.

2.8 Project Personnel

All project personnel and subcontractor personnel shall understand and comply with the requirements of this HASP. The PE, STR, or JSS will brief project personnel at the start of each shift. During the prejob briefing, all daily tasks, associated hazards, engineering and administrative controls, required personal protective equipment (PPE), work control documents, and emergency conditions and actions will be discussed. Input from the project HSO, IH, and RadCon personnel to clarify task specific health and safety requirements will be provided. All personnel are encouraged to ask questions regarding project tasks and provide suggestions on ways to perform required tasks in a more safe and effective manner based on the lesson learned from previous day's activities.

Once at the project, personnel are responsible for identifying any potentially unsafe situations or conditions to the STR, PE, JSS, and HSO for corrective action. If it is perceived that an unsafe conditions poses an imminent danger, project personnel are authorized to stop work immediately, then notify the STR, PE, JSS, and HSO of the unsafe condition.

2.9 Nonworkers

All persons who may be on the project, but are not part of the field team, are considered nonworkers for the purposes of this project (e.g., surveyor, equipment operator, or other crafts personnel not assigned to the project). Persons shall be considered "onsite" when they are present in or beyond the designated support zone (SZ). Nonworkers will be deemed occasional site workers per 29 CFR 1910.120/1926.65, and must meet minimum training requirements for such workers and any additional project-specific training that is identified in Section 4. If the nature of a nonworker's tasks requires entry into the exclusion zone (EZ), or radiological controlled areas, then they must meet all the

same training requirements as other field team members. Also, a project representative must accompany all nonworkers until they have completed their 3 days of supervised field experience.

2.10 Visitors

All visitors with official business at the project, including BBWI personnel, representatives of DOE, and/or state or federal regulatory agencies, may not proceed beyond the SZ without receiving project-specific HASP training, signing a HASP training acknowledgment form, receiving a safety briefing, wearing the appropriate PPE, and providing proof of meeting all training requirements specified in Section 4 of this HASP. Visitors will be escorted by a fully trained project representative (such as the STR, PE, JSS, or HSO, or a designated alternate) at all times while on the project.

A casual visitor to the project is a person who does not have a specific task to perform or other official business to conduct at the project. Casual visitors are not permitted on the project.

2.11 Health and Safety Officer

The health and safety officer (HSO) is the person assigned to the project who serves as the primary contact for health and safety issues. The HSO advises the PE and STR on all aspects of health and safety, and is authorized to stop work at the project if any operation threatens worker or public health and/or safety. The HSO may be assigned other responsibilities, as stated in other sections of this HASP, as long as they do not interfere with the primary responsibilities. The HSO is authorized to verify compliance to the HASP, conduct inspections, require and monitor corrective actions, monitor decontamination procedures, and require corrections, as appropriate. The HSO is supported by ESH&QA professionals at the project (i.e.: safety engineer, IH, RCT, and RE, as necessary).

Persons assigned as the HSO, or alternate HSO, must be qualified (per the OSHA definition) to recognize and evaluate hazards, and will be given the authority to take or direct actions to ensure that workers are protected. While the HSO may also be the IH, SE, or in some cases the STR or PE (depending on the hazards, complexity, and size of the activity involved, and required concurrence from the ER SH&QA manager) at the project, other project responsibilities of the HSO must not conflict (philosophically or in terms of significant added volume of work) with the role of the HSO at the project.

If it is necessary for the HSO to leave the project, an alternate individual will be appointed by the HSO to fulfill this role, the identity of the acting HSO will be recorded in the STR logbook, and project personnel will be notified.

Note: *The HSO will ensure the appropriate ESH&QA personnel participate in the development and verification of the hazards screening profile checklist (STD-101) or hazards screening checklist in accordance with MCP-3562.*

2.11.1 Industrial Hygienist

The assigned industrial hygienist (IH) is the primary source for information regarding nonradiological hazardous and toxic agents at the project. The IH assesses the potential for worker exposures to hazardous agents according to the Company *Safety and Health Manual*, MCPs, and accepted industry IH practices and protocol. By participating in project characterization the IH assesses and recommends appropriate hazard controls for the protection of project personnel, operates and maintains airborne sampling and monitoring equipment, reviews for effectiveness, and recommends and assesses the use of PPE required in this HASP (recommending changes as appropriate).

Note: *The IH will review all "Employee Job Function Evaluations," Form 340.02 to validate the management's completion of the form. After validation, the form is sent to the OMP for the scheduling of a medical evaluation, as needed.*

Following an evacuation, the IH in conjunction with other recovery team members will assist the STR or PE in determining whether conditions exist for safe project reentry as described in Section 11. Personnel showing health effects (signs and symptoms) resulting from possible exposure to hazardous agents will be referred to an OMP physician by the IH, their supervisor, or the HSO. The IH may have other duties at the project, as specified in other sections of this HASP, or in Company PRDs and/or MCPs. During emergencies involving hazardous materials, airborne sampling and monitoring results will be coordinated with members of the Emergency Response Organization (ERO).

2.11.2 Safety Professional

The assigned safety professional reviews work packages, observes project activity, assesses compliance with the Company *Safety and Health Manual*, signs SWPs, advises the STR and PE on required safety equipment, answers questions on safety issues and concerns, and recommends solutions to safety issues and concerns that arise at the project. The safety professional may have other duties at the project as specified in other sections of this HASP, or in Company PRDs and/or MCPs.

2.11.3 Fire Protection Engineer

The assigned fire protection engineer reviews the work packages, conducts pre-operational and operational fire hazard assessments, and is responsible for providing technical guidance to project personnel regarding all fire protection issues.

2.11.4 Radiological Control Technician

The assigned radiological control technician (RCT) is the primary source for information and guidance on radiological hazards and will be present at the project during all operations. Responsibilities of the RCT include radiological surveying of the project, equipment, and samples, providing guidance for radioactive decontamination of equipment and personnel, and accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radionuclide contamination occurs. The RCT must notify the STR or PE of any radiological occurrence that must be reported as directed by the INEEL *Radiation Protection Manual*. The RCT may have other duties at the project as specified in other sections of this HASP, or in Company PRDs and/or MCPs.

Note: *The INTEC Radiological department shall establish work controls, initially and as an ongoing activity, throughout Phase 1 while working within the INTEC area but outside of the tank farm. These same work control efforts will be performed when Phase 2 is performed within the tank farm and will ensure that workers are given adequate protection from potential radiological exposure. The issuance of radiological work permits, the establishing of radiological buffer areas (RBA), or radiological material areas (RMA) will be determined during the radiological assessment.*

2.11.5 Radiological Engineer

The radiological engineer (RE) is the primary source for information and guidance relative to the evaluation and control of radioactive hazards at the project. The RE will provide engineering design criteria and review of containment structures and makes recommendations to minimize health and safety risks to project personnel. Responsibilities of the RE include (1) performing radiation exposure estimates and as low as reasonably achievable (ALARA) evaluations, (2) identifying the type(s) of radiological

monitoring equipment necessary for the work, (3) advising the STR or PE and RCT of changes in monitoring or PPE, and (4) advising personnel on the project evacuation and reentry. The RE may also have other duties to perform as specified in other sections of this HASP or in the *INEEL Radiation Protection Manual*.

2.12 INTEC Site Area Director

The INTEC site area director (SAD) reports to the director of site operations and interfaces with the INTEC facility manager. The INTEC SAD is responsible for several functions and processes in the INTEC area that include

- All work processes performed in the INTEC area
- Executing the enhanced work planning for the INTEC area
- All environmental compliance within the INTEC area
- Executing that portion of the voluntary consent order that pertains to the INTEC area
- Correcting the root cause functions of the accident investigation in the INTEC area
- Correcting the root cause functions of the voluntary consent order for the INTEC area.

2.13 WAG 3 Environmental Coordinator

The assigned WAG 3 environmental coordinator oversees, monitors, and advises the STR and PE performing project activities on environmental issues and concerns by ensuring compliance with DOE orders, EPA regulations, and other regulations concerning the effects of project activities on the environment. The ER environmental coordinator provides support surveillance services for hazardous waste storage and transport, and surface water/storm water runoff control.

2.14 WAG 3 Quality Engineer

The WAG 3 quality engineer provides guidance on the project quality issues. The quality engineer observes project activities and verifies that project operations comply with quality requirements pertaining to these activities. The quality engineer identifies activities that do not comply or have the potential for not complying with quality.

3. RECORDKEEPING REQUIREMENTS

3.1 Industrial Hygiene and Radiological Monitoring Records

The IH will record airborne monitoring and/or sampling data (both area and personal) and input the information into the Hazards Assessment and Sampling System (HASS). All monitoring and sampling equipment shall be maintained and calibrated per Company procedures and the manufacturer's specifications. Industrial hygiene airborne monitoring and sampling data is treated as limited access information and maintained by the IH per Company *Safety and Health Manual* procedures. Any airborne monitoring or sampling done by non-IH/safety personnel will be documented in a project-controlled logbook, to be reviewed, signed, and dated by the IH.

The RCT maintains a logbook of all radiological monitoring, daily project operational activities, and instrument calibrations. Radiological monitoring records are maintained according to the INEEL *Radiation Protection Manual* procedures.

Project personnel, or their representative have a right to both IH and RCT monitoring and sampling (both area and personal) data. Results from monitoring will also be communicated (and recorded in the STR Logbook) to all field personnel during daily Plan of the Day (POD) meetings and formal pre-job briefings according to MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews."

3.2 STR Logbook and Project Attendance Logbook

The STR will keep a record of daily project events in the STR logbook and shall maintain accurate records of all personnel (workers and nonworkers) who are onsite each day in a project attendance logbook. Logbooks must be obtained from Administrative Record and Document Control (ARDC). Completed logbooks are submitted to ARDC along with other documents at the project's completion.

3.3 Administrative Record and Document Control Office

The ARDC shall organize and maintain data and reports generated by field activities. The ARDC maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of the management plans for the project, this HASP, the quality program plan for the project, the QAPjP, and other documents pertaining to this work are maintained in the project file by the ARDC. All project records and logbooks, except IH and RCT logbooks, must be forwarded to ARDC within 30 days after completion of field activities.

4. PERSONNEL TRAINING

All project personnel shall receive training as specified in OSHA 29 CFR 1910.120/1926.65 and the Company *Safety and Health Manuals*. Radiation workers shall be trained according to the INEEL *Radiation Protection Manual*, MCP-126, "Training." Table 4-1 summarizes training requirements for project personnel. Specific training requirements for each worker may vary depending on the hazards associated with their individual job assignment and required access into radiological controlled areas.

4.1 General Training Requirements

Proof that all required training courses have been completed (including applicable refresher training) must be maintained on the project at all times. Examples of acceptable written training documents include: "40 Hour OSHA HAZWOPER Card," "Respirator Authorization Card," "DOE Certificate of Core Radiological Training II Card," "Medic/First Aid Training Card," and/or a copy of an individual's TRAIN System printout demonstrating completion of training. A copy of the certificate issued by the institution where the training was received is also acceptable proof of training. The DOE radiological worker training must be documented on an official authorized card and have the designated INEEL project-specific training stamped or written on the card.

4.2 Project-Specific Project Training

Before beginning work at the project, WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project-specific training will be conducted by the PE, STR, HSO, or others, as appropriate. This training will consist of a complete review of this HASP and attachments, applicable job safety analysis (JSA), safe work permits (SWP), radiological work permits (RWP), technical procedures (TPR) and other applicable work control/authorization documents with time for discussion and questions. Project specific instruction can occur in conjunction with the formal pre-job briefing (MCP-3003) or separately.

At the time of project-specific training, personnel training records will be checked and verified to be current and complete for all required training shown in Table 4-1. Upon completing project-specific training, personnel will sign the training acknowledgement form (Appendix A of this HASP) indicating that they have received this training, understand the tasks that will be conducted, associated hazards, and agree to follow all HASP and other safety requirements.

For this project, each (40-hour) HAZWOPER trained worker's performance will be monitored by the STR, PE, or HSO for 3 days of project activities as part of the Project Specific HASP training. This will satisfy the HAZWOPER initial 24-hour supervised field experience.

Note 1: *Supervised field experience is only required if personnel have not previously completed this training at another CERCLA/RCRA project (documented) or they are up-grading from 24-hour to 40-hour HAZWOPER training.*

Note 2: *See Appendix A for copies of project forms that must have originals submitted to the EO training coordinator for inclusion in the TRAIN system within 5 working days of completion of training.*

Table 4-1. Required training for project personnel.

Task/Position (Topic)	STR, PE, JSS, or HSO (X = Required)	Field Team (X = Required)	Nonworkers (X = Required) ^a	Visitors ^b (X = Required)
Project-specific training ^c	X	X	X	X
Decontamination (HASP Section 10) ^d	X	X	X	X
Hazard communication ^d	X	X	X	X
Project control and warning devices ^d	X	X	X	X
HASP emergency response plan (Section 11) ^d	X	X	X	X
40-hour HAZWOPER ^e	X	X		X ^g
24-hour HAZWOPER occasional worker ^f			X	X ^g
8-hour HAZWOPER site supervisor	X			
Hearing conservation	X ^g	X ^g	X ^g	X ^g
DOE RAD Worker II/RAD Worker I	X	X	X ^g	
CPR and Medic First Aid ^h	X			
Respirator qualification and fit test	X ⁱ	X ⁱ		
INTEC site-specific training	X	X	X	X
HAZMAT employee general awareness training ^j	X	X	X	

a. Nonworkers who must enter the EZ/RBA are required to have the training necessary to perform their assigned tasks within the EZ/RBA. This may include the same training as STR (depending on the task location).

b. Visitors are required to meet the nonworker training requirements, at a minimum, if they enter the EZ/RBA.

c. Training will be documented using HASP acknowledgement forms (project-specific and 24-hr supervised experience).

d. Will be included in project-specific training.

e. Includes 40 hours of classroom instruction and 24 hours of supervised field experience.

f. Includes 24 hours of classroom instruction and 8 hours of supervised field experience.

g. As required based on project duties and project zone access requirements.

h. Two Medic First Aid/CPR-qualified individuals must be present during project activities.

i. If entering areas requiring respirator use.

j. If identified as "HAZMAT" employee (i.e., anyone who directly affects hazardous material transportation safety by handling, packaging, labeling, loading, unloading, moving, driving, etc. [per 49 CFR 171.8]).

4.3 Pre-Job Briefing

The STR, PE, HSO, RCT, and JSS, as applicable, will conduct a daily pre-job safety briefing of the task(s) to be performed that day. During this briefing, tasks are to be outlined, hazards identified, hazard controls and work zones established, PPE requirements discussed, and employees' questions answered. At the completion of this briefing work control documents will be read and signed (SWP[s], RWP[s], etc.). Particular emphasis will be placed on lessons learned from the previous day's activities and how tasks can be completed in the safest, most efficient manner. All personnel will be asked to contribute ideas to enhance worker safety and mitigate potential exposures at the project. During the pre-job briefing waste minimization opportunities will also be discussed.

Additional training will be included as project-specific training for personnel involved in work associated with the identified nitric acid during excavation activities. Training will include information to identify and mitigate hazards associated with sampling activities; trace the identified material to its origin or source; institute controls to stop leaks; and place material in appropriate containers for proper on-Site or off-Site disposal. The additional training will address the following:

- Hazard communication awareness on nitric acid, lead, mercury, and chrome as appropriate
- Decontamination procedures on these specific chemicals
- Project controls and warning devices
- Emergency response.

5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

The project personnel shall participate in the INEEL OMP, as required by DOE Order 5480.8a and OSHA 29 CFR 1910.120/1926.65. Medical surveillance examinations will be provided before assignment, annually, and after termination of hazardous waste site duties or employment. This includes personnel who are or may be exposed to hazardous substances at or above the OSHA permissible exposure limit (PEL) or published exposure limits, without regard to respirator use, for 30 or more days per year. Personnel who wear a respirator in performance of their job, or who are required to take respirator training to perform their duties under this plan, must participate in the medical evaluation program for respirator use at least annually as required by 29 CFR 1910.134.

A single copy of this HASP, task hazard analysis, required PPE, confined space entry, and other exposure related information must be provided to an OMP physician for each employee participating in WAG 3, OU 3-13 Group 1 Soils, Tank Farm Interim Action project activities. Exposure monitoring results and hazard information furnished to the OMP physician must be supplemented or updated annually as long as the employee is required to maintain a hazardous waste/hazardous material employee medical clearance.

Note 1: *The project manager shall ensure that an Employee Job Function Evaluation is validated by the project IH and then submitted to the OMP for review before any employee can begin work on the project.*

Note 2: *Employees shall not be permitted to work the project until the OMP has sent a medical clearance to management or the IH has validated that no potential exists for exposure above the established action levels and that no additional substance-specific medical evaluations are required.*

The OMP physician shall evaluate the physical ability of an employee to perform the work assigned, as identified in the project HASP or other job-related documentation. A documented medical clearance (physician's written opinion) will be provided to the employee and line management stating whether the employee has any detected medical condition that would place him/her at increased risk of material impairment of his/her health from work in hazardous waste operations, emergency response, respirator use, and confined space entry (as applicable). The physician may impose restrictions on the employee by limiting the amount and/or type of work performed. The OMP responsibilities, with regard to personnel assigned to hazardous waste project activities, include, but are not limited to the following:

- Providing current comprehensive medical examinations (as determined by the examining physician) at an INEEL medical facility for full-time personnel
- Obtaining records/reports from employee's private physicians, as required by the OMP director
- Performing a medical evaluation on return-to-work cases following an absence in excess of one work-week (40 consecutive work-hours) resulting from illness or injury
- Conducting a medical evaluation in the event that management questions the ability of an employee to work or if an employee questions his/her own ability to work.

The attending physician will evaluate all information provided including medical questionnaires, physical exam findings, blood chemistry and urinalysis results, preexisting medical conditions, nature of work to be performed, actual and potential hazards and exposures, and other factors deemed appropriate by the physician for determining the following for each employee:

- Ability to perform relevant occupational tasks
- Ability to use respiratory protection
- Ability to work in other PPE and heat/cold stress environments
- Requirement for entry into substance-specific medical surveillance programs.

If the OMP does not have sufficient information to complete a medical evaluation before respirator training, the employee's supervisor will be notified. The employee will not be permitted to fit test until the needed information is provided and any additional examination or testing is completed.

5.1 Subcontractor Personnel

Subcontracted project personnel shall participate in a subcontractor medical surveillance program that satisfies the requirements of OSHA 29 CFR 1910.120/1926.65. This program must make available medical examinations before assignment, annually, and after termination of hazardous waste duties. The physician's written opinion will serve as documentation that subcontractor personnel are fit for duty.

Medical data from the subcontractor employee's private physician, collected pursuant to hazardous material worker qualification, shall be made available to the OMP physicians upon request. Also, subcontractor employee's past radiation exposure histories must be submitted to BBWI radiation dosimetry and records section, in accordance with the *INEEL Radiation Protection Manual*, MCP-188, "Issuance of Thermoluminescent Dosimeters and Obtaining Employees Dose History" and MCP-2381, "Employees Exposure Questionnaire" of the *INEEL Radiation Protection Manual*.

5.2 Injuries on the Project

It is Company policy that an OMP physician examine all injured personnel if an employee is injured on the job, if an employee is experiencing signs and symptoms consistent with exposure to a hazardous material, or if there is reason to believe that an employee has been exposed to toxic substances, or physical or radiological agents in excess of allowable limits.

Note: *Subcontracted employees will be taken to the closest INEEL medical facility to have an injury stabilized before transport to the subcontractor's treating physician or medical facility.*

In the event of a known or suspected injury or illness due to exposure to a hazardous substance, or physical or radiological agent, the employee(s) shall be transported to the nearest BBWI medical facility for evaluation and treatment, as necessary. The STR is responsible for obtaining as much of the following information as is available to accompany the individual to the medical facility:

- Name, job title, work (project) location, and supervisor's name and phone number
- Substances, physical or radiological agents (known or suspected); material safety data sheet (MSDS), if available

- Date of employee's first (known) exposure to the substance, physical or radiological agent
- Locations, dates, and results of any airborne exposure monitoring and/or sampling
- PPE in use during this work (for example, type of respirator and cartridge used)
- Number of days per month PPE has been in use
- Anticipated future exposure to the substance, physical or radiological agent.

Further medical evaluation will be determined by the treating/examining physician according to the signs and symptoms observed, hazard involved, exposure level, and specific medical surveillance requirements established by the OMP director in compliance with 29 CFR 1910.120/1926.65.

The INTEC SS will be notified if any illness or injury occurs at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project. As soon as possible after an injured employee has been transported to the INEEL medical facility, the STR, PE or designee will make notifications as indicated in Section 11 of this HASP.

The RadCon personnel will evaluate all actual and/or suspected abnormal radiological exposures in excess of allowable limits and will establish the follow-up actions. For internal uptakes (as calculated committed effective dose equivalent values), engineering design file (EDF)- INEL003, "Established Levels of Radionuclide Intake for Consideration of Medical Intervention" will be used as the basis for this evaluation and follow-up actions. All wounds will be examined by an OMP physician to determine the nature and extent of the injury. The physician will determine if the wound can be bandaged adequately for entry into a radiological contamination area in accordance with Article 542 of the *INEEL Radiological Protection Manual*.

5.3 Substance-Specific Medical Surveillance

WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action remedial tasks will be conducted in areas that have been characterized and present a low to medium potential for chemical and/or radiological exposure or up-take. Those areas with potential radiological exposure have been identified and when medical evaluation is necessary employees have been assigned to the OMP for a medical evaluation.

Based on this, additional regulatory mandated substance-specific medical surveillance does not apply. If additional contaminants of concern are identified during the project, exposures will be evaluated and quantified to determine if a substance-specific standard applies.

6. ACCIDENT PREVENTION PROGRAM

The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action activities present numerous potential chemical, radiological, and physical hazards to personnel conducting the required tasks. It is critical that all personnel understand and follow the project-specific requirements of this HASP. Engineering controls, hazard isolation, specialized work practices, and the use of PPE will all be implemented to eliminate or mitigate all potential hazards and exposures, as necessary. However, every person on the project must play their role in the identification and control of hazards.

6.1 Voluntary Protection Program

The INEEL safety process embraces the Voluntary Protection Program (VPP) criteria, principles, and concepts. All levels of management are responsible for implementing safety policies and programs and for maintaining a safe and healthful work environment. Project personnel and subcontractors are expected to take a proactive role in preventing accidents, ensuring safe working conditions for themselves and fellow personnel, and complying with all work control documents and approved procedures.

The VPP is a process that promotes and encourages continuous safety improvement but is not a requirement of any regulatory agency. INEEL and effected subcontractors participate in VPP and ISM for the safety of their employees. The five key elements for VPP and ISM are

<u>VPP</u>	<u>ISM</u>
Management Commitment	Define Work Scope
Employee Involvement	Analyze Hazards
Work Site Analysis	Develop/Implement Controls
Hazard Prevention and Control	Perform Work Within Controls
Safety and Health Training	Provide Feedback/Improvement

6.2 General Safe-Work Practices

The following procedures are mandatory for all BBWI and subcontractor personnel working on the project. All project visitors entering the project area (SZ and beyond) must follow these procedures. Failure to follow these practices may result in permanent removal from the project and other disciplinary actions. The STR, PE, and HSO are responsible for ensuring these hazard control practices are followed at the project:

- Limit access to authorized INEEL, subcontractor, and visitor personnel only.
- All personnel have the authority to initiate “stop work” actions. Company *Safety and Health Manual*, MCP-553, “Stop Work/Shut Down Action” shall be used.
- Absolutely no eating, drinking, chewing gum or tobacco, smoking, applying cosmetics, or any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials except in designated zone(s).

- Be aware of and comply with all safety signs, color codes, and barriers. Adhere to Company *Safety and Health Manual 14A*, MCP-2714, "Safety Signs, Color Codes, and Barriers."
- Be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and broken containers. Report all potentially dangerous situations to the STR, PE, or HSO.
- Avoid direct contact with potentially contaminated substances. Do not walk through spills or other areas of contamination. Avoid kneeling, leaning, or sitting on equipment or ground that may be contaminated.
- Be familiar with the physical characteristics of the project, including, but not limited to
 - Wind direction
 - Accessibility of fellow personnel, equipment, and vehicles
 - Communications at the project and with other nearby facilities
 - Areas of known or suspected contamination
 - Major roads and means of access to and from the project
 - Nearest water sources and fire fighting equipment
 - Warning devices and alarms
 - Capabilities and location of nearest emergency assistance.
- Report all broken skin or open wounds to the HSO, STR, or PE. A OMP physician will determine if the wound presents a significant risk of internal chemical or radiological exposure. The OMP physician will consider how the wound can be bandaged and will recommend PPE to be worn by the injured employee. Personnel with unprotected wounds shall not be permitted to enter chemical or radiological contaminated areas, nor shall they handle contaminated or potentially contaminated materials at the project without having been examined by a OMP physician.
- Prevent releases of hazardous materials, including those used at the project. If a spill occurs, try to isolate the source (if possible and if this does not create a greater exposure potential), then report it to the STR, PE, or HSO. The INTEC SS will be notified and additional actions taken as described in Section 11. Appropriate spill response kits, or other containment and absorbent materials, will be maintained at the project.
- Avoid unnecessary and excessive movement during decontamination.
- Electrical equipment, wiring, cables, switches, and current overload protection will meet applicable regulations and be maintained in a manner that provides protection for project personnel from shock hazards, injury, and prevents property damage. Ground-fault protection will be provided whenever outdoor electrical equipment is used.

- Keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments and use non-sparking, explosion-proof equipment if advised to do so by a safety professional.
- Personnel working in the exclusion or controlled access zone shall implement the “buddy system” (see Section 6.5 of this HASP).
- Proceed directly to a radiological survey station upon leaving a radionuclide-contaminated zone. Care should be taken not to touch the face, mouth, and eyes before a survey has been performed.
- Personnel who wear contact lenses shall comply with the Company *Safety and Health Manual 14A, MCP-2716, “Personal Protective Equipment.”*

6.3 ALARA Principles

All radiation exposure of project personnel shall be controlled such that radiation exposures are well below regulatory limits, and there is no radiation exposure without commensurate benefit. Unplanned and preventable exposures are considered unacceptable. All project tasks will be evaluated with the goal of eliminating or minimized exposures. Following ALARA principles and practices is the responsibility of all project personnel. All personnel working at the project must strive to keep both external and internal radiation doses ALARA by adopting the following practices.

Note: *The INTEC Radiological department shall establish work controls, initially and as an on-going activity, throughout Phase I while working within the INTEC area but outside of the tank farm. These same work control efforts will be performed when Phase II is performed within the tank farm and will ensure that workers are given adequate protection from potential radiological exposure. The issuance of radiological work permits, the establishing of radiological buffer areas (RBA), or radiological material areas (RMA) will be determined during the radiological assessment.*

6.3.1 External Radiation Dose Reduction

Sources for external radiation exposure are found in Table 1-1 and identified in the RWP, as needed. Basic protective measures used to reduce external doses include minimizing time in radiation areas, maximizing the distance from the source of radiation, and using shielding whenever possible. The following are methods to minimize external dose:

Methods for Minimizing Time

- Plan and discuss the tasks prior to entering radiation area (including having all equipment and tools prepared)
- Perform as much work as possible outside radiation areas and take advantage of lower dose rate areas (as shown on the radiological survey maps)
- Take the most direct route to the tasks project and work efficiently
- If problems occur in the radiation areas, hold technical discussions outside radiation areas, then return to the work area to complete the task

- If stay times are required, know your stay time and use appropriate signal and communication method to let others in the area know when the stay time is up
- Know your current dose and your dose limit. **DO NOT EXCEED YOUR DOSE LIMIT.**

Methods for Maximizing Distance from Sources of Radiation

- Use remote operational controls
- Stay as far away from the source of radiation as possible (extremely important for point sources where, in general, if the distance between the source is doubled, the dose rate falls to $\frac{1}{4}$ the original dose rate)
- Know the most recent project radiological survey map high and low dose rate locations and take advantage of low dose rate areas.

Proper Use of Shielding

- Take advantage of the project equipment and enclosures for shielding yourself from radiation sources
- Wear safety glasses and the appropriate respirator (depending on the task as indicated on the RWP) to protect eyes from beta radiation.

6.3.2 Internal Radiation Dose Reduction

An internal radiation dose potential exists at the project from radionuclide contamination. An internal dose is a result of radioactive material being taken into the body. Radioactive material can enter the body through inhalation, ingestion, absorption through wounds or injection from a puncture wound. Reducing the potential for radioactive material to enter the body is critical to avoid internal dose. The following are methods to minimize internal radiation dose:

- Wear respiratory protection required for the task, perform all leak checks, and inspect all PPE prior to entering areas requiring respirator protection
- Know the project RWP potential and known high and low contamination sources, locations, and minimize or avoid activities in these areas
- Utilize high efficiency particulate air (HEPA) exhaust system
- When inside contaminated areas, do not touch your face (adjust glasses or PPE) or other exposed skin
- When exiting contaminated areas, follow all posted instructions and remove PPE in the order prescribed (if questions arise, ask RadCon personnel)
- Conduct whole body personnel survey when exiting the contaminated area, then proceed directly to the personnel contamination monitor (PCM)

- Report all wounds or cuts (including scratches and scraps) before entering radiological contaminated areas
- Wash hands, face, etc., before eating, drinking, smoking, or other activity that may provide a pathway for contaminants.

6.4 Nonradiological Contaminant Exposure Avoidance

The same potential exposure pathways that exist for radionuclide contamination apply equally to nonradiological contaminants. Each contaminant has distinct physical, chemical, and mechanical properties that determine its toxicity. Threshold-limit values (TLVs) have been established to provide guidelines in evaluating airborne and skin exposure to these chemicals and materials. They represent levels and conditions under which it is believed that nearly all workers may be exposed day after day without adverse health effects. Based on these TLVs, specific action limits have been established (Section 8) to further limit the potential for approaching these contaminant TLVs.

The same engineering controls employed to eliminate or mitigate airborne radioactivity will serve to control nonradiological airborne contaminants. Every effort will be made to isolate the source of these hazards through engineering controls and containment where feasible. Some of these contaminants pose other exposure hazards from contact and skin absorption and the implementation of avoidance practices will serve to minimize the potential for exposures. Some methods of exposure avoidance at the project include

- Ensuring all HEPA systems are operating when they must be opened or handled
- Collecting bags to isolate the source of contamination
- Wearing all required PPE, inspecting all pieces before donning, taping all seams
- Changing gloves frequently (when soiled) to prevent the spread of contamination
- Changing PPE if it becomes damaged or soiled with source contaminant material (such as, sludge or waste residue)
- Containerize samples to avoid handling twice
- Minimize time in known or suspected contamination areas (vapors, sludge, waste residue)
- Doff PPE following radiological instructions and perform personnel whole body survey as directed by the task RWP (if radionuclide contamination is present, it is likely that other nonradiological forms of contamination are also present—if contamination is found, perform decontamination for both)
- Wash hands, face, etc., before eating, drinking, smoking, or other activity that may provide a pathway for contaminants.

6.5 The Buddy System

The two person or “buddy system” will be used at the project when personnel have entered into the exclusion zone/radiological buffer area (EZ/RBA). The buddy system requires each employee to assess

and monitor his or her buddy's mental and physical well being during the course of the workday. A buddy must be able to do the following:

- Provide assistance
- Verify the integrity of PPE
- Observe their partner for signs and symptoms of heat stress, cold stress, or contaminant exposure
- Notify other personnel in the EZ/RBA if emergency assistance is needed.

Workers need to be able to see or hear and effectively communicate with their buddy at all times when in the EZ/RBA. Project personnel will be assigned a "buddy" by the STR or PE and continually check on their "buddy" while work is performed in the EZ/RBA.

7. PROJECT CONTROL AND SECURITY

Based on the known, expected, and potential levels of radiological and chemical contamination present in the waste at the project, work zones/radiological areas will be established for the project. Work zones may range from rope barriers and signs to the controlled work zones shown in Figure 7-1. Entry into and exit out of project work zones will be controlled through the appropriate use of barriers, signs, and other measures that are described in detail in this section (refer to the INEEL *Safety and Health Manual*). Personnel not directly involved with activities shall be excluded from entering work zones. Nonworkers, such as inspectors, may be admitted to the project provided they are on official business; escorted by the HSO, STR, or PE; and have demonstrated compliance with the training requirements in Section 4 of this HASP.

Note 1: *The HSO, IH, and Radiological personnel will assist the STR, PE, and JSS in establishing the EZ/RBA, as appropriate, contamination reduction zone (CRZ), and SZ for the project based on IH EA, project characterization, and radiological evaluations (see Section 7.1).*

Note 2: *Visitors may not be allowed beyond the SZ during certain project tasks. The determination for any visitor's demonstrated need for access beyond the SZ will be made by the STR and HSO (in consultation with INTEC radiological personnel).*

Figure 7-1 illustrates the appropriate zones that may be established at project. Both radiological and nonradiological hazards (including industrial safety hazards) will be evaluated when establishing the initial zone locations and size. Common barriers may be used to delineate both radiological and nonradiological work-zone postings, depending on the nature and extent of contamination. If common barriers are used, they will be delineated and posted according to both sets of requirements (29 CFR 1910.120 and 10 CFR 835) using appropriate colored rope and postings. These zones may change in size and location as project tasks evolve, based on project monitoring data, and as wind direction changes. Additionally, entrances and egress points may change based on these same factors. If required by the HSO, IH, and RadCon, work zones will include

- Exclusion zone (EZ)/radioactive buffer area (RBA)
- CRZ, including a contamination reduction corridor (CRC)
- Support zone (SZ).

The establishment of postings and controlling access to radiological controlled areas at the project shall be in accordance with the INEEL *Radiological Control Manual*. Radiologically controlled areas will be established by RadCon personnel at the project and described in the project RWP.

Note: *The INTEC Radiological department shall establish work controls, initially and as an on-going activity, throughout Phase I while working within the INTEC area but outside of the tank farm. These same work control efforts will be performed when Phase II is performed within the tank farm and will ensure that workers are given adequate protection from potential radiological exposure. The issuance of radiological work permits, the establishing of radiological buffer areas (RBA), or radiological material areas (RMA) will be determined during the radiological assessment.*

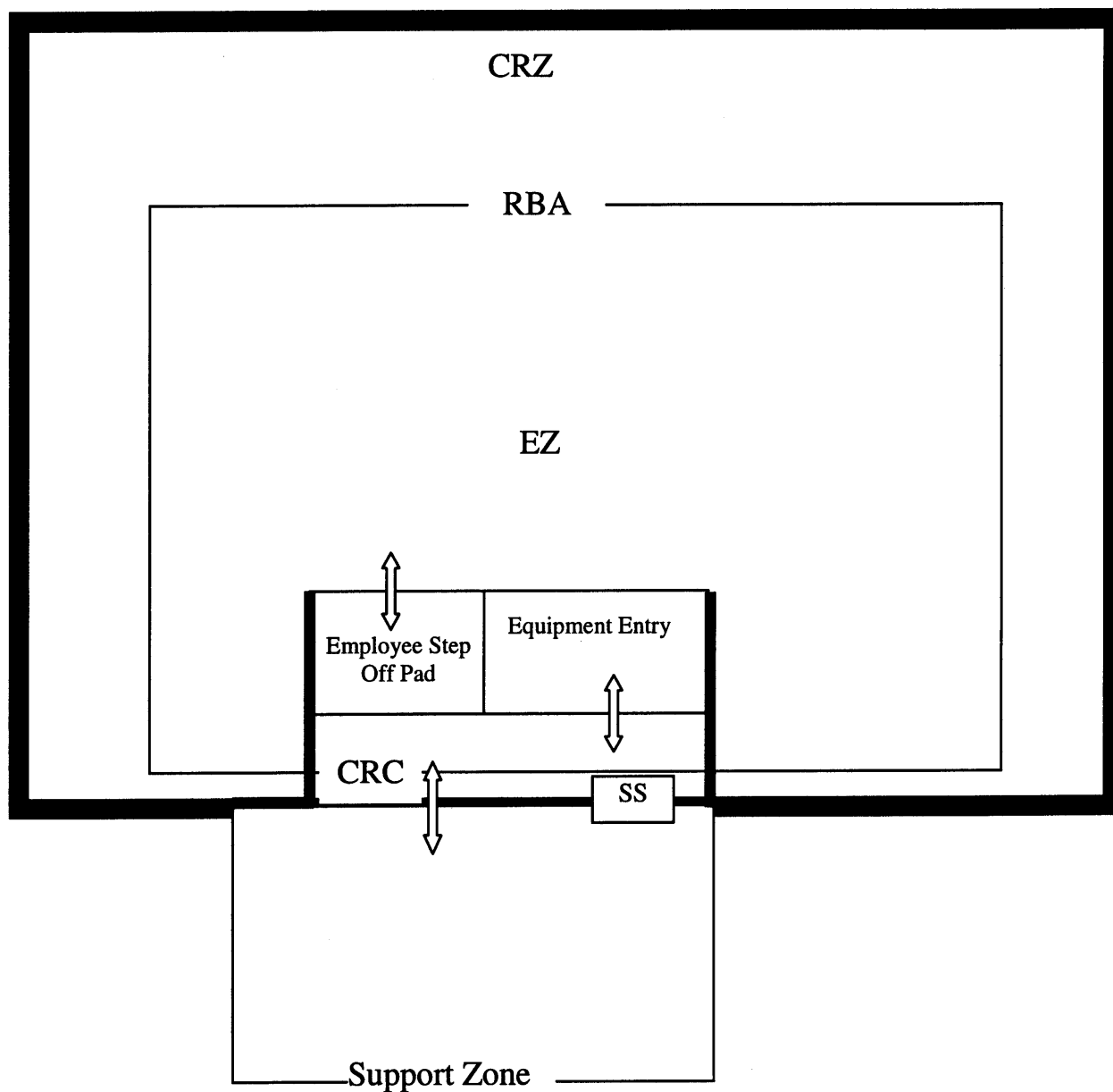


Figure 7-1. Established controlled work (EZ/RBA, CRZ, and SZ) zones for the project.

7.1 Exclusion Zone/Radiological Buffer Area

The EZ/RBA will be large enough to encompass all work areas. The minimum number of personnel required to safely perform the project tasks will be allowed into the EZ/RBA. The EZ/RBA is a controlled access zone at all times. An entry and exit point will be established at the periphery of the EZ/RBA/CRC to regulate the flow of personnel and equipment. A sign-in board or log will be used to track entry in and exit out of the EZ/RBA. The EZ/RBA boundary will be delineated with rope or printed hazard ribbon.

Factors that will be considered when establishing the EZ/RBA boundary include (1) air monitoring data, (2) radiological contamination data, (3) radiation fields, (4) equipment in use, (5) the physical area necessary to conduct project operations, and (6) the potential for contaminants to be blown from the area. The boundary may be expanded or contracted, as this information becomes available, based on the aforementioned evaluations.

Note: *Non-project personnel are not permitted in the EZ/RBA without proper escort and satisfying the appropriate training requirements for being in the EZ/RBA.*

When radiological conditions warrant, controlled areas will be established within the EZ/RBA to restrict the movement of personnel and equipment to prevent the potential spread of contamination. These areas could include a step-off pad for entering and exiting the CRC, and a radiological buffer area (RBA) around the entire CRC and step off pad. Entry and exit for the CRC will be through the step-off pad area. Additionally, the step-off pad area may be enlarged to serve the CRZ as a staging area for used and/or contaminated PPE and supplied airline respirators or self-contained breathing apparatus (SCBA). Explicit instructions will be posted advising personnel on PPE requirements, donning and doffing techniques, personnel/equipment survey instructions, and other necessary instructions. All contaminated and potentially contaminated PPE will be containerized and stored within the CRC until fully characterized. All items (including PPE, equipment, debris, etc.) generated during the radiological decontamination process, shall be characterized in compliance with the *INEEL Radiological Control Manual*.

No equipment will be released from the CRC until a comprehensive radiological survey has been completed (hand-held instruments, swipes, etc.) in accordance with the *INEEL Radiological Control Manual* and has met the radionuclide-specific free release criteria described in DOE Order 5400.5, Section II-5(c), and listed on Figure IV-1 (5400.5). All personnel who enter the EZ/RBA will wear the appropriate level of PPE for the degree and type of hazards present as listed in Section 9 of this HASP.

7.2 Contamination Reduction Zone and Corridor

The project contamination reduction zone (CRZ) and contamination reduction corridor (CRC) are transition areas surrounded by the EZ/RBA, and are located between the EZ/RBA and SZ (see Figure 7-1). The CRZ and CRC will serve to buffer and further reduce the probability of the SZ becoming contaminated. All project personnel and equipment entering and exiting the EZ/RBA will transition through the CRC. Physical transfer of contaminating substances on personnel, equipment or in the air will be minimized through restricting traffic to these controlled areas. The CRC may serve as a staging area for equipment and temporary rest areas for personnel. Because of the potential for contamination (migration from airborne contamination in the EZ/RBA), PPE and sample packaging and preparation equipment will be stored in the SZ.

As stated in the EZ/RBA section, all equipment and materials will be surveyed by RadCon personnel and must meet the free release criteria before being released out of the CA. If radiological or mixed contamination (nonradiological/radiological) is found, then radiological decontamination techniques will initially be used, as described in Section 10.2.3. One of the radiological decontamination goals is not to generate any free liquid. By utilizing dry decontamination techniques (HEPA vacuum, adhesive tape, etc.) and avoiding radiological instrument shielding problems from the use of liquid washing methods, the likelihood of spreading contamination will be eliminated. A nonradiological decontamination pad may be established if it is believed that residual nonradiological contamination is present on equipment following release from the CA. The project IH will be responsible for nonradiological contamination issues and determining the most appropriate decontamination methods, as described in Section 10.2.3. A designated portion of the CRC will be established for the nonradiological decontamination of equipment (if required). All decontamination supplies (nonradiological decontamination solution, Teri wipes, etc.) and used nonradiological PPE and debris waste containers may be located in the CRC.

7.3 Support Zone

The SZ will be considered a radiological and nonradiological "clean" area. The location of the SZ will be upwind of the EZ/RBA (where possible) and readily accessible to the nearest road. The SZ is a controlled area outside the EZ/RBA. Support facilities (project management and RadCon trailers), project command center, vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment will all be located in the SZ. Visitors who have not had appropriate training and have not received project-specific training will be restricted to this zone.

Note: *The support zone lines of demarcation shall be established and posted.*

The project SZ area will be delineated using construction fence or equivalent material to prevent non-project personnel from entering the area and/or inadvertently entering a more restrictive work zone (e.g., CRZ or EZ/RBA).

Project work zones and radiological controlled areas will be maintained during off-hours and weekends. These zones and areas will remain intact until all project tasks have been completed and equipment and supplies have been decontaminated and removed from the project. The STR, PE, HSO, and RCT will ensure that project zones are posted and intact when leaving the project, and will be responsible for breaking down the zones when project activities have been completed.

Note: *Only RadCon personnel can post and remove radiological control postings. This will be accomplished in accordance with the INEEL Radiological Control Manual.*

7.4 Designated Eating and Smoking Area

Ingestion of hazardous substances is likely when workers do not practice good personal hygiene habits. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. No smoking, chewing, eating, applying lip balm, or drinking is allowed within the project work zones. It is important to note that as an exception to the rule, drinking water will be allowed within the support zone. All personnel who *exit* a CA must complete a whole body survey as directed by the RWP or RCT. Prior to exiting the CRC into the SZ all personnel will use the PCM or hand-held survey instruments located at the nearest survey station. It is important to re-enforce to the employees, either through a pre-job briefing or by a general

discussion by the JSS that as a minimum, all personnel will wash their hands prior to using designated eating or smoking areas.

The designated eating and smoking areas for the project personnel will be properly posted and identified in accordance with company procedures and policies.

Personnel will not be permitted to smoke in any of the project work zones (EZ/RBA, CRZ, CRC, or SZ). Only approved INTEC facility smoking areas or smoking areas located outside will be used by project personnel. All smoking policies will be complied with including disposing smoking materials in the proper receptacle.

8. HAZARD ASSESSMENT

The overall objectives of this hazard assessment section are to provide guidance for the following:

- Evaluation of existing INTEC radionuclide-contaminated soils waste content where intrusive activities will occur to determine the radiological, chemical, and biological exposure potential to WAG 3, OU 3-13 Group 1 Soils Tank Farm Interim Action project personnel by all routes of entry
- Evaluation of all WAG 3, OU 3-13 Group 1 Soils Tank Farm Interim Action project tasks to determine the extent that existing radiological, chemical, and physical hazards may potentially impact project personnel
- Establishment of the necessary monitoring and sampling required to continuously evaluate exposure and contamination levels, determine adequate action levels (ALs) to mitigate potential exposures, and provide specific actions to be followed if ALs are reached
- Engineering control determination, isolation methods for mixed waste contamination from personnel, work practices to limit personnel exposure, administrative controls, and appropriate respiratory protection and protective clothing to protect project personnel from hazards.

8.1 WAG 3, OU 3-13 Group 1 Soils Tank Farm Interim Action Project Activities

Personnel may be exposed to safety hazards, chemical, radiological, and physical agents during implementation of the Interim Action. Contaminated soil at the tank farm has historically been contaminated with both chemical and radiological contaminants. These contaminants are generally secured underground and are encountered during soil disturbance operations in which the direct radiation fields may also increase from exposed system piping. The magnitude of these hazards to personnel entering the work zones is dependent on both the chemical/radiological nature of the contaminants encountered and the intrusive tasks being performed. Engineering controls will be implemented (whenever possible), along with adequate work practices, real-time monitoring of contaminants, and project-specific hazard training to further mitigate potential exposures and hazards.

Table 8-1 summarizes each primary task and the associated hazards. Table 8-2 presents an evaluation of these radiological and nonradiological contaminants with respect to potential routes of exposure and symptoms of overexposure. Additionally, the exposure potential by all routes is stated based on quantity of material present, toxicity, and any other known result. Engineering and administrative controls, worker personal protective clothing strategies, personnel monitoring, and restricted access to potential CA will focus on those contaminants that have been determined to present a “moderate” to “high” exposure potential (see Table 8-2). Several of the nonradiological contaminants listed (e.g., asbestos, cadmium, and beryllium) have extremely low TLV based on airborne exposure to these inorganic substances in their pure form. Specific constituents not included in Table 8-2 may also be used depending on the awarded subcontractor choice of specific manufacturer chemicals.

The Interim Action project activities potentially involve known radiological hazards that will be evaluated according to the *INEEL Radiological Control Manual*. There are three such areas of concern: (1) an area that has radiological contamination, (2) an underground RMA, and (3) an area inside of INTEC but outside of the tank farm when soil penetration is greater than 2 inches below ground level.).

Table 8-1. WAG 3, OU 3-13 Group 1 Soils Tank Farm Interim Action activities and the associated hazards.

Activity or Task	Associated Hazards or Hazardous Agent
Mobilization	Industrial safety hazards, dust, lifting/back strain, heat stress, hazardous noise levels
Surveying excavation areas	Industrial safety hazards, noise hazards, radiation exposure, radiological & chemical/inorganic contamination, lifting/back strain, heat stress, dust,
Grade & line with concrete all existing stormwater collection ditches	Industrial and construction safety hazards, radiological and chemical contamination, dust, heat stress, hazardous noise levels, lifting/back strain
Excavating with heavy or light equipment	Industrial & construction safety hazards, confined space entry, shoring and excavation hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, noise hazards
Construction of evaporation pond including installing the HPDE liner	Industrial & construction safety hazards, confined space entry, shoring and excavation hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, noise hazards
Excavation of lift station	Industrial & construction safety hazards, confined space entry, shoring and excavation hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, noise hazards
Excavation of trenches deeper than 5 ft	Industrial & construction safety hazards, confined space entry, shoring and excavation hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, noise hazards
Replace existing culverts	Industrial & construction safety hazards, dust, heat stress, radiological & chemical/inorganic contamination, radiation exposure, lifting/back strain,
Installation of pumps and electrical connections in the lift station.	Industrial safety hazards, electrical safety hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, hazardous noise levels
Packaging, loading, or removing soils	Industrial safety hazards, dust, lifting/back strain, heat stress, radiological and chemical/inorganic contamination, radiation exposure, noise hazards
Install concrete head walls and end walls	Industrial & construction safety hazards, radiation exposure, radiological & chemical/inorganic contamination, dust, lifting/back strain, heat stress
Surface soils with an impermeable spray on coating	Industrial and construction safety hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, working in protective clothing, heat stress, spray of chemical beyond project
Equipment decontamination (if necessary)	Industrial safety hazards, radiological and chemical/inorganic contamination, dust, radiation exposure, lifting/back strain, heat stress, hazardous noise levels, pressurized water (steam)
Demobilization	Industrial safety hazards, heat stress, noise hazards, radiation exposure, radiological & chemical/inorganic contamination, dust, lifting/back strain

Table 8-2. Evaluation of radiological and nonradiological hazardous chemicals at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project.

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^e	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
Metals and Inorganic Compounds						
Arsenic 7440-38-2	OSHA PEL—0.01 mg/m ³	Ih, Ig, Con, S	Ulceration of nasal system, dermatitis, gastrointestinal disturbance, peripheral neuropathy, respiratory irritant, hyper-pigmentation of skin	Liver, kidneys, lungs, skin, lymphatic system	No	Low
Hydrogen Fluoride 7664-39-3	ACGIH TLV - 3 ppm OSHA PEL - 3 ppm	Ih, Ig, Con, S	May be fatal if inhaled or ingested, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema, coughing, laryngitis, shortness of breath, headache, nausea, vomiting, shown to have mutagenic effects	Liver, kidneys	No	Low
Organic Compounds						
Benzene 71-43-2	OSHA PEL - 1 ppm STEL - 5 ppm	Ih, Ig, S, Con	Irritant eyes, skin, nose, respiratory system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, lassitude, dermatitis, bone marrow depressant	Eyes, skin, respiratory system, blood, central nervous system, bone marrow (leukemia)	Yes IARC-1 NIOSH OSHA TLV - A2	Low
Carbon disulfide 75-15-0	ACGIH TLV - 10 ppm OSHA PEL - 20 ppm	Ih, Ig, S, Con	Skin irritation, irritating to eyes, mucous membranes, and upper respiratory tract, Damage to kidneys liver and heart, nervous system disturbances, convulsions, mutagenic effects	Eyes, female and male reproductive system, nerves, liver, kidneys, heart	No	Low

Table 8-2. (continued).

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^c	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
Carbon tetrachloride 56-23-5	ACGIH TLV - 100 ppm OSHA PEL - 100 ppm	Ih, Ig, S, Con	Vapor or mist irritating to eyes, mucous membranes and upper respiratory tract, skin irritation, stomach pains, vomiting, diarrhea, nausea, dizziness and headache, damage to eyes, liver and kidneys, carcinogen, may alter genetic material, reproductive disorders	Liver, kidneys, readily absorbed through skin	Yes ACGIH	Low
Ethyl benzene 100-41-4	ACGIH TLV - 100 ppm OSHA PEL - 100 ppm STEL - 150 ppm	Ih, Ig, S, Con	Irritant eyes, skin, nose, respiratory system, excitement, drowsiness, incoordination, corneal vacuolization, headache, nausea, staggered gait, anorexia, nausea, vomiting, abdominal pain, dermatitis	Eyes, skin, respiratory system, central nervous system	No	Low
Kerosene 8008-20-6 (VOC)	NIOSH PEL - 14 ppm	Ih, Ig, S, Con	Ulceration of nasal system, dermatitis, gastrointestinal disturbance, peripheral neuropathy, respiratory irritant, hyper-pigmentation of skin	Liver, kidneys, lungs, skin, lymphatic system	No	Low
Chromium (7440-47-3)	ACGIH TLV-05.mg/m ³	Ih, Ig, Con	Irritation of eyes and skin, lung fibrosis (histologic)	Eyes, skin, respiratory tract	No	Low Potential. Source-limited presence determined by initial characterization sampling.

Table 8-2. (continued).

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^e	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
Lead (7439-92-1)	ACHIG TLV - 0.05mg/m ³ OSHA PEL - 0.05 mg/m ³	Ih, Ig, Con	Lassitude, weight loss, anemia, nausea, vomiting, paralysis, constipation	GI tract, central nervous system, kidneys, blood, gingival tissue.	A3-BEI	Low Potential Sources include sampling activities, hand excavation, repair, and clean- up work.
Mercury (7439-97-6)	ACGIH TLV—0.025 mg/m ³	Ih, Ig, Con, Abs	Irritation eyes, skin; cough, chest pain, dyspnea, bronchial pneumonitis; tremor, insomnia, irritability, indecision, headache, fatigue, weakness; gastrointestinal disturbance, anorexia, low weight	Eyes, skin, respiratory tract, central nervous system, kidneys	No	Low potential
Polyurea Part A Methylenebis (4-Cyclohexyl- isocyanate)	PEL = 0.01ppm TLV = 0.005ppm	Ih, S	Skin sensation, respiratory irritant,	Skin, lungs	No	Low
Part B Titanium dioxide	ACGIH 10mg/m ³ OSHA 15.0mg/m ³	Ig, S,	Eye irritant, toxic by dermal absorption,	Skin, eyes	No	Low when mixed
Carbon Black	ACGIH 3.5mg/m ³ OSHA 3.5mg/m ³	Ig, S	Eye irritant, toxic by dermal absorption	Skin, eyes	No	Low when mixed

Table 8-2. (continued).

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^c	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
Nitric Acid (HNO ₃) 7697-37-2	NIOSH REL: TWA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) NIOSH REL: TWA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) IDLH 25 ppm	Ih, Ig, S, Con	Irritation eyes, skin, mucous membrane; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eyes, skin, respiratory system, teeth	No	Moderate
Pyridine 110-86-1	ACGIH TLV - 5 ppm OSHA PEL - 5 ppm	Ih, Ig, S, Con	High concentrations are extremely destructive to tissues of the mucous membranes and the upper respiratory tract, burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting, anorexia, dizziness, tachycardia, nervousness, insomnia, skin disorders	Liver, kidneys, nerves, bone marrow	No	Low
Tetrachloroethylene 127-18-4	ACGIH TLV -25 ppm OSHA PEL - 100 ppm	Ih, Ig, S, Con	Causes skin irritation, nausea, dizziness, headache, narcotic effect, damage to liver and kidneys, may alter genetic material, targets the nerves, heart, liver, and kidneys	Liver, kidneys, nerves, heart	Yes ACGIH	Low
Toluene 108-88-3	ACGIH TLV - 50 ppm OSHA PEL - 100 ppm STEL - 150 ppm	Ih, Ig, Con, S	Irritant eyes, nose, fatigue, weak, confusion, euphoria, dizziness, headache, dilated pupils, lacrimation, nervousness, muscle fatigue, insomnia, paresthesia, dermatitis, liver and kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	No	Low

Table 8-2. (continued).

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^e	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
1,1,1- Trichloroethane 71-55-6	ACGIH TLV - 350 ppm OSHA PEL - 350 ppm	Ih, Ig, S, Con	High concentrations are extremely destructive to tissues of the mucous membranes and upper respiratory tract, eyes and skin, symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting, narcotic effect, dermatitis, mutagenic effects, damage to the liver and kidneys	Liver, kidneys	No	Low
Trichloroethylene 79-01-6	ACGIH TLV - 5 ppm OSHA PEL - 5 ppm	Ih, Ig, S, Con	High concentrations are extremely destructive to tissues of the mucous membranes and upper respiratory tract, eyes and skin, burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting	Central nervous system, liver, kidneys, heart lungs	Yes ACGIH	Low
Xylene 1330-20-7	ACGIH TLV - 100 ppm STEL - 150 ppm	Ih, Ig, Con, S	Irritant eyes, skin, mucous membranes, headache, dermatitis, narcosis, coma	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	No	Low
Cesium 137	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic, Whole body radiation cellular damage to soft issues	Whole Body, spleen, kidney	Yes	Low
Cesium 134	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic, Whole body radiation cellular damage to soft issues	Whole Body, spleen, kidney	Yes	Low

Table 8-2. (continued).

Radiological and Chemical Contaminants of Concern	Exposure Limit ^{a or d} (PEL/TLV) ^a (DAC) ^e	Routes of Exposure ^b	Symptoms of Overexposure (Acute and Chronic)	Target Organs/System	Carcinogen? (source) ^c	Expected Levels
Strontium 90	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Lungs, red marrow, bone surfaces	Yes	Low
Cobalt 60	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Lungs	Yes	Low
Cerium 144	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Lungs	Yes	Low
Europium 154	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Red marrow and bone surfaces	Yes	Low
Europium 155	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Red marrow and bone surfaces	Yes	Low
Europium 152	4.0 E-8 Ci/ml Lung Retention Class D	Ih, Ig	Carcinogenic, Mutagenic	Red marrow and bone surfaces	Yes	Low

a. American Conference of Governmental Industrial Hygienists (ACGIH) 1997 TLV Booklet and OSHA 29 CFR 1910 substance specific standards. *This pertains to the nonradiological chemicals listed within this table.*

b. (Ih) inhalation; (Ig) ingestion; (S) skin absorption; (Con) contact hazard.

c. If yes, identify agency and appropriate designation (ACGIH A1 or A2; NIOSH; OSHA; IARC; NTP, or ICRP 60 (International Commission on Radiological Protection)).

d. 10 CFR 835.209, Occupational Radiation Protection, Appendix A. *This pertains to the radiological constituents listed within this table.*

e. DAC = derived air concentration guide

f. ICRP 60 (International Commission on Radiological Protection).

PEL = permissible exposure limit

NTP = National Toxicology Program

TLV = threshold limit value

VOC = volatile organic compound

DAC = Derived Air Concentration Guide

STEL = short term exposure limit

IARC = International Agency for Research on Cancer

MSDSs for these chemicals are available at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project trailer.

The results of this evaluation(s) will determine if an RWP for the Phase 1 activities is required. For Phase 2, an RWP will be required for all activities involving soil disturbances that go below 6 in. or the existing tank farm membrane. Radiological control will use existing engineering design files (EDF) in accordance with the INEEL *Radiological Control Manual* and issue additional EDF, as needed, during the evaluation of potential airborne radiological exposures.

The SWP and RWP will be used in conjunction with this HASP to address hazardous and radiological conditions at the project. These permits will augment this HASP and further detail the specialized protective equipment and dosimetry requirements.

8.2 Routes of Exposure

Exposure pathways for hazardous materials and radionuclides are directly related to the nature of radionuclide-contaminated soils removal project tasks. Engineering controls (HEPA filtration), continuous monitoring, training, and work controls will mitigate potential contact and uptake of these hazards; however, the potential for exposure to soil contaminants still exists. Exposure pathways include

- Inhalation of radionuclide-contaminated organic compounds and fugitive dusts during intrusive activities and decontamination tasks. This contamination form may have trace amounts of inorganic compounds, and be contaminated with radionuclides resulting in potential lung deposition.
- Skin absorption and contact with radiological contaminated organic and inorganic compounds during the soils removal action can be absorbed through unprotected skin or corrosion, resulting in chemical burns, uptake through skin absorption and/or skin contamination.
- Ingestion of radionuclide-contaminated organic and inorganic compounds adsorbed to dust particles or waste residues can be taken up through the gastrointestinal (GI) tract, resulting in GI irritation, internal tissue irradiation, and/or deposition to target organs.
- Injection, while handling radionuclide-contaminated organic and inorganic materials, by breaking of the skin or migration through an existing wound, resulting in localized irritation, contamination, uptake of soluble contaminants, and deposition of insoluble contaminants.

8.3 Environmental and Personnel Monitoring

The potential for exposure to radiological and nonradiological hazards exists during many of the tasks that will take place within the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action projects and effects all personnel who work within a CRZ and EZ/RBA. Refinement of work control zones (see Section 7), engineering and administrative controls, worker training, and the use of protective equipment will mitigate most of these hazards to a large degree. Monitoring with direct reading instruments will be conducted to provide RadCon and IH personnel with real-time data to assess the effectiveness of these controls.

The IH and RadCon personnel will focus on the activities and monitor with direct reading instrumentation, swipes, and full and partial period air sampling in accordance with the applicable technical procedures and other times as deemed appropriate. Other workers and areas adjacent to any project will also be monitored to verify the integrity of core sample packages, ensure contamination has not migrated from radionuclide-contaminated material areas or waste containers, and to determine the effectiveness of contamination control and decontamination practices.

Personnel working at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action projects may be exposed to hazardous materials or hazardous physical agents as already described. Safety hazards and other physical hazards will be monitored and controlled as outlined in Section 8.4 of this HASP. Specific hazardous agent exposures that will be monitored are listed in Table 8-3.

8.3.1 Industrial Hygiene Monitoring

When there is a potential for the spread of contamination during the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action, monitoring for surface radiological contamination will provide an additional indicator of nonradiological hazards. Various direct reading instruments and other semi-quantitative detection tests will be used to determine the presence of nonradiological and other physical agents. The frequency and type of sampling and monitoring will be determined by changing project conditions, direct reading instrument results, observation, and professional judgement. Instruments and sampling methods listed in Table 8-4 will be used by the project IH as deemed appropriate.

All full and partial period airborne contaminant sampling will be conducted using applicable NIOSH or OSHA methods and in conformance to the INEEL *Safety and Health Manual*. Risk assessments for project personnel will be conducted according to the INEEL *Safety and Health Manual*.

8.3.1.1 Industrial Hygiene Instrument and Equipment Calibration. All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing IH protocol, and in conformance with the INEEL *Safety and Health Manual*. Direct reading instruments will be calibrated, at a minimum, prior to daily use and more frequently as determined by the project IH. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded per Section 3.1.

8.3.2 Radiological Monitoring

During WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project tasks, the potential exists for exposure to both external penetrating ionizing radiation [gamma, neutron, and high-energy beta] and internal radiation (inhalable, ingestible, or absorbed radioactive contaminants). As with the nonradiological contaminants discussed above, the greatest potential for both external and internal radiation exposures will be minimal for all scopes of work and will occur during the excavation of the soils.

Note: *The INTEC Radiological department shall establish work controls, initially and as an on-going activity, throughout Phase I while working within the INTEC area but outside of the tank farm. These same work control efforts will be performed when Phase II is performed within the tank farm and will ensure that workers are given adequate protection from potential radiological exposure. The issuance of radiological work permits, the establishing of radiological buffer areas (RBA), or radiological material areas (RMA) will be determined during the radiological assessment.*

Based on the unique and distinctive hazards presented by both external and internal radiation sources, they will be evaluated, controlled, and monitored individually (although the detection of any radionuclides will serve to alert for the presence of both). For purposes of this monitoring section, they will be discussed separately and distinguished by their effects as radiation (external) and contamination (internal). Radiological monitoring at the Group 1 Tank Farm Interim Action project will include area, airborne, equipment, and personnel monitoring. Monitoring will be performed in accordance with the INEEL *Radiological Control Manual*.

Table 8-3. The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project radiological and nonradiological hazards to be monitored.

Task or Activity	Radiological and Nonradiological Hazards to be Monitored ^a
WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action mobilization	Hazardous noise levels
Surveying excavation areas	Radiological contamination, dust, heat stress, hazardous noise levels, chemical monitoring as appropriate
Excavating with heavy or light equipment	Radiological contamination, dust, heat stress, hazardous noise levels, chemical monitoring as appropriate
Excavating by hand	Radiological contamination, dust, heat stress, lifting/back strain, hazardous noise levels, chemical monitoring as appropriate
Spraying on polyurea soil cover	Radiological contamination, dust, chemical exposure
Decontamination	Radiological contamination, dust, heat stress, hazardous noise levels, chemical monitoring as appropriate
Dumping excavated soils	Radiological contamination, dust, heat stress, hazardous noise levels, chemical monitoring as appropriate
Characterization sampling	Radiological contamination, dust, hazardous noise levels, chemical monitoring as appropriate
Demobilization	Radiological and chemical contamination, dust, heat stress, hazardous noise levels

a. Monitoring and sampling will be conducted as deemed appropriate by project IH and RadCon personnel based on specific tasks and project conditions.

8.3.2.1 Radiation Monitoring. Sources for external radiation hazards include elevated background levels from the waste, exposure from waste material brought to the surface, and the handling of sealed radioactive sources. Since external radiation sources exist throughout the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action area, a variety of area and personnel monitoring methods will be used. These may include the use of direct reading radiation detectors (ion chambers, GM, neutron, etc.), thermoluminescent dosimeter (TLD), albedo and electronic dosimetry, and possibly the use of alarming remote area monitors (RAMs). This data will be used by RadCon personnel to evaluate the effectiveness of engineering controls, ensure work zone boundaries are adequate, alert project personnel to potential high radiation sources, and ensure the effectiveness of decontamination methods and procedures.

8.3.2.2 Contamination Monitoring. The greatest potential for radioactive contamination will be from the excavation of soils (i.e., greater than 2 in. outside the tank farm within INTEC, greater than 6 in. or below the existing membrane within the tank farm, or due to an underground RMA and radiological area outside of INTEC within CFA). Contamination is of particular concern due to its mobility, the difficulty in detection, and therefore, ease of cross-contamination. Due to the presence of beta-gamma emitting radionuclides, beta-gamma radioactive contamination is also a concern. Contamination monitoring for alpha and beta-gamma radioactive contamination will be accomplished using extensive survey and swipe collection techniques. Low background alpha-beta counters, located at the soils removal project, will be used to quantify contamination levels. This data will be used by RadCon personnel to evaluate the effectiveness of engineering controls, ensure radiological area boundaries are adequate, alert project personnel to avoid contaminated areas, and ensure the effectiveness of personnel and equipment decontamination procedures.

Table 8-4. Equipment to be used for monitoring radiological and nonradiological hazards.^a

Chemical or Radiological Hazard to be Monitored or Sampled	Equipment and Monitoring/Sampling Method	
VOCs and chlorinated VOCs (screening)	HNu-101 PIDs , FIDs, or equivalent (10.6 or 11.7 eV lamps per IH)	
Radiological contamination (alpha)	Count-rate—Bicron/NE Electra (DP-6 or AP-5 probe) or equivalent Stationary—Eberline RM-25 (HP-380AB or HP-380A probe) or equivalent CAM—ALPHA 6-A-1 (in-line and radial sample heads, pump, RS-485) or equivalent (as required) Grab Sampler—SAIC H-810 or equivalent	
Radiological contamination (beta/gamma)	Count-rate—Bicron NE/Electra (DP-6, BP-17 probes) or equivalent Stationary—Eberline RM-25 (HP-360AB probe) or equivalent CAM (beta)—AMS-4 (in-line and radial head, pump RS-485) or equivalent (as required) Grab Sampler—SAIC H-810 or equivalent	
Radiological contamination (general counting)	LB-5100 Counting System or equivalent Alpha/Beta Scaler Protean equivalent	
Personnel contamination monitors	Eberline PCM-2 or PCM-1C or equivalent	
Radiation (gamma and neutron) fields and Geiger-Mueller (GM) instruments	Ion Chamber—Eberline RO-20 with RO-7 (2, 200 & 20K probes) or equivalent GM Dose Rate—Ludlum 2241 (HP-270 probe) or equivalent Neutron—Eberline E-600 or equivalent Electronic dosimetry—SAIC PD-3I with reader and RCIMS station or equivalent	
Dust and particulate air sampler	Personal sampling pumps and appropriate media/portable air sampler	
Hazardous noise levels (>85 dBA for an 8 hour workday, 83 dBA for a 10 hour day, >140 impact)	ANSI Type S2A sound level meter and/or ANSI S1.25-1991 dosimeter (A-weighted scale for TWA dosimetry, C-weighted for impact dominant sound environments)	
Heat/cold stress	Heat Stress—body wt, fluid intake	Cold Stress—ambient air temp, wind chill charts
a. Air sampling will be conducted as deemed appropriate by project IH and RadCon personnel based on initial direct reading instrument data, swipes, and other project factors (homogeneity of coring material, radiological contamination/fields, external waste residue, etc.).		
eV = electron volts	SAIC = Science Application International Corporation	AMS = alarm monitoring system
RCIMS = radiological control information management system	ANSI = American National Standards Institute	TWA = time weighted average
HNu = photoionization detector	FID = flame ionization detector	dBA = decibel-A-weighted scale
	PID = photoionization detector	

8.3.2.3 Radiological Instrument and Equipment Calibration. The RadCon personnel will use radiation and contamination detectors and counters listed in Table 8-4 to provide radiological information to the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project personnel. Daily operational and source checks will be performed on all portable survey instruments to ensure they are within the specified baseline calibration limits. Accountable radioactive sources will be maintained in accordance with the INEEL *Radiological Control Manual*. All radiological survey and monitoring equipment will be maintained and calibrated in accordance with the manufacturer's recommendations, existing RadCon protocol, and in conformance with the INEEL Radiological Control Manual, and in accordance with 10 CFR 835.703(d).

8.3.2.4 External Dosimetry. Based on RadCon requirements and exposure potentials at the Group 1 Tank Farm Interim Action project, all personnel who enter the project area will be required to wear personal dosimetry devices in accordance with the INEEL *Radiological Control Manual*. Dosimetry for personnel entering the EZ/RBA will consist of a basic TLD and an electronic dosimeter. Dosimetry requirements will be stated in the task RWP. The Radiological Control and Information Management Systems (RCIMS) will be used at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project to track external radiation exposures to project personnel. Individuals are responsible for ensuring all required personal information is provided to RadCon personnel for entry into the RCIMS and logging in each day.

8.3.2.5 Internal Monitoring. Internal radiation sources (removable and airborne contamination) at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project include the contaminants in Table 8-2 and decontamination tasks. The purpose of internal dose monitoring is to demonstrate the effectiveness of contamination control practices and to document the nature and extent of any internal uptakes that may occur.

Internal dose evaluation programs shall be adequate to demonstrate compliance with Table 2-1 of 10 CFR 835(d). The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project personnel are responsible for submitting all required bioassay samples upon request.

8.3.3 RadCon Engineer/IH Exposure Assessments

To prevent and mitigate potential personnel exposure to radiological, nonradiological, and physical hazards at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, AL have been established for contaminants that have been evaluated and determined to present a moderate to high exposure potential (listed in Table 8-2). These AL, and associated responses, are listed in Table 8-5. If AL are reached, personnel will take the appropriate actions as listed. For PPE upgrades, the threshold for the particular level being currently worn must be exceeded or another type of contaminant introduced that will require modifications (i.e., Level B ensemble offers the highest level of respiratory protection deemed appropriate for this project, so no further upgrade would be appropriate).

8.4 Physical Hazards Evaluation, Control, and Monitoring

The physical hazards present at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project and the methods that will be used to monitor and control them are described in this section. It is critical that all personnel are aware and understand the nature of the tasks that will be conducted, the equipment to be used, and the controls in place to eliminate or mitigate potential safety hazards.

Table 8-5. Action levels and associated responses for Group 1 Soils Tank Farm Interim Action project hazards.

Contaminant/Agent Monitored	Action Level	Response Taken if Action Levels Exceeded
Organic vapors (11.7 eV lamp)	<5 ppm in workers' breathing zone	Monitor near source for elevated levels, ensure personnel are on upwind side of source, and continue to monitor.
(Applies only if not in Level C or B respiratory protection)	5–10 ppm sustained for 1 minute in workers' breathing zone	Continue working, pull CCL ₄ detector tube sample. <u>If <5 ppm</u> , continue working, periodic monitoring (minimum every 5 minutes). <u>If >5 ppm</u> , leave area until vapor dissipates then continuous monitoring or don minimum of Level C respiratory protection ^a and continue working.
(Applies only if not in Level C or B respiratory protection)	10–25 ppm in workers' breathing zone	If episodic—leave area until dissipates, perform continuous monitoring or don minimum Level C respiratory protection and continue working. If sustained—don minimum Level C respiratory protection. ^a
	25–50 ppm in workers' breathing zone	<u>Evacuate</u> area and don minimum Level C respirator protection, ^a continue periodic monitoring (minimum every 5 minutes).
	>50 ppm in work area	<u>Evacuate</u> area consult STR whether to abandon core hole, if not, don Level B respirator protection, and continue periodic monitoring (minimum every 5 minutes).
Hazardous noise levels	<85 dBA 8hr TWA, <83dBA 10hr TWA	No action.
	85–114 dBA	Hearing protection required to attenuate to below 85 dBA 8 hr TWA or 83 dBA for 10hr TWA (based device NRR).
	(a) >115 dBA (b) >140 dBA	Isolate source, evaluate NRR for single device, double protection as needed. Control entry, isolate source, only approved double protection worn.
Radiation field	<5 mrem/hr	No action, no posting required.
	5–100 mrem/hr @ 30 cm §835.603.b)	Post as "Radiation Area"—Required items: RW I or II training, RWP, personal dosimetry.
	>100 mrem - 500 Rad @ 30 cm (§835.603.b)	Post as "High Radiation Area"—Required items: RW II, RWP, alarming personal dosimetry, dose rate meter, and temporary shielding (as required).
	Exceed RAM alarming set point, if required (fast ringing bell, flashing red light)	Evacuate area immediately, muster at CRZ and await instruction from RadCon.

Table 8-5. (continued).

Contaminant/Agent Monitored	Action Level	Response Taken if Action Levels Exceeded
Radiological contamination	1-100 times RCM Table 2-2 values (§835.603.d)	Post as "Contamination Area," Required items: RW II training, personal dosimetry, RWP, don PPE, bioassay submittal (as required).
	>100 times RCM Table 2-2 values (§835.603.d)	Post as "High Contamination Area"—Required items: RW II training, personal dosimetry, RWP (with prejob briefing), don PPE, bioassay submittal (as required).
Dust	>5 mg/m ³	Increase dust control
Heat stress	Temperatures exceed 90°F or use of full anti-Cs	Monitor heat stress in accordance and implement appropriate work/rest schedule as directed by IH.
Airborne radioactivity	Concentrations (μCi/cc) >30% of DAC value (§835.603.d)	Post as "Airborne Radioactivity Area"—Required items: RW II training, personal dosimetry, RWP (with pre-job briefing), don PPE, bioassay submittal (as required).
	Exceed CAM alarming set point, if required (fast ringing bell, flashing red light)	If not in Level B respiratory protection-evacuate upwind to CRZ, await RadCon. If in Level B respiratory protection-leave immediate area to upwind location, maintain airline connection and await RadCon instructions.

a. Level C respiratory protection will consist of a full-face respirator equipped with a combination multichemical-HEPA cartridge (i.e., MSA GMC-H) as prescribed by the project IH. See Section 9, Personal Protective Equipment for additional Level C requirements.

b. Section 11, for the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project details specific events and appropriate emergency responses. Any release should be considered an emergency event and require at least an evacuation of the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project area in accordance with technical procedure (TPR)-161, Nonstandard Drilling Events.

NRR = Noise reduction rating ppm = parts per million
RW = Radiological Worker mREM = milli-roentgen equivalent man
RCM = Radiological Control Manual DAC = derived air concentration
CAM = continuous air monitor

8.4.1 Temperature Extremes

The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project activities may be conducted during months where there is a potential that both heat and cold stress factors could affect project personnel based on ambient air temperatures and layered PPE.

8.4.1.1 Heat Stress. Outside temperatures are expected to be variable during WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, and personnel will be required to wear protective clothing that prevents the body from cooling. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort, unconsciousness, to death. Personnel must inform the STR, PE or HSO when experiencing any signs and/or symptoms of heat stress, or observe a fellow employee (“buddy”) experiencing them. The INEEL *Safety and Health Manual*, and Table 8-6 of this section describe heat stress hazards further.

Monitoring for heat stress conditions shall be performed according to the INEEL *Safety and Health Manual*. Depending on the ambient weather conditions, work conditions, type of PPE worn, and the physical response of work operations personnel, the IH/RCT shall inform the STR, and PE of necessary adjustments to the work/rest cycle. Additionally, physiological monitoring may be conducted to determine if personnel are replenishing liquids fast enough. A supply of cool drinking water will be provided in designated eating areas, the support zone, and consumed only in these areas. Workers may periodically be interviewed by the IH/RCT or HSO to ensure that the controls are effective and that excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and to take breaks if symptoms of heat stress occur. The signs of heat stress are listed in Table 8-6.

Individuals showing any of the symptoms of heat exhaustion listed in Table 8-6 will (1) stop work, (2) exit work area, (3) be decontaminated (as appropriate), (4) remove protective clothing, (5) move to sheltered area to rest, (6) be provided cool drinking water, and (7) be monitored by a Medic or CPR/First Aid-certified employee.

Personnel exhibiting signs and/or symptoms of heat stroke will be immediately transported to the nearest medical facility for medical attention. Section 11 details additional emergency situations and associated responses.

Note: *Heat exhaustion and heat stroke are extremely serious conditions that can result in death and should be treated as such. Transport individual immediately to the nearest medical facility.*

8.4.1.2 Low Temperatures. Exposure to low temperatures will likely be a factor during the time of WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action activities and can be at other times of year if the conditions warrant. Relatively cool ambient temperatures and wet or windy conditions increase the potential for cold injury to personnel. The project IH and HSO will be responsible for obtaining meteorological information to determine if additional cold stress administrative controls are required. The INEEL *Safety and Health Manual* discusses the hazards and monitoring of cold stress. Project personnel will also be cautioned regarding cold stress factors associated with rapid cooling once impermeable PPE layers are removed causing the potential for freezing of accumulated moisture on PPE outer and inner surfaces (under extremely cold conditions). Table 9-2 of this HASP requirements must be followed for the outer layer of protection based on radiological and nonradiological hazards. Workers should wear layered warm clothing (heavy socks, hooded garments, etc.) to prevent cold stress when the air temperature is below 4 to 7°C (40 to 45°F).

Table 8-6. Heat stress signs and symptoms.

Heat-Related Illness	Signs and Symptoms	Emergency Care
Heat rash	Red skin rash and reduced sweating	Keep the skin clean; change all clothing daily; cover affected areas with powder containing cornstarch or with plain cornstarch.
Heat cramps	Severe muscle cramps, exhaustion, sometimes with dizziness or periods of faintness	Move the patient to a nearby cool place; give the patient half-strength electrolytic fluids; if cramps persist, or if more serious signs develop, seek medical attention.
Heat exhaustion	Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; dizziness that sometimes leads to unconsciousness	Move the patient to a nearby cool place; keep the patient at rest; give the patient half-strength electrolytic fluids; treat for shock; seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT.
Heat Stroke	Deep, then shallow, breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); seizures or muscular twitching	Cool the patient rapidly. Treat for shock. If cold-packs or ice bags are available, wrap them and place one bag or pack under each armpit, behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as rapidly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND.

When the air temperature is below -1 to +4°C (30 to 40°F), depending upon worker comfort, clothing for warmth, in addition to chemical protective clothing, shall be worn. This may include

- Cold Stress
 - Insulated suits, such as whole-body thermal underwear
 - Wool or polypropylene socks to keep moisture off the feet if there is a potential for work activity that could cause sweating
 - Insulated glove liners when air temperatures are extremely low (less than -12 to -15°C [5 to 10°F]), gloves with reflective surfaces, which reflect body heat back to the hand, should be used)
 - Insulated boots, head cover such as hard hat liners
- At air temperatures below 1.7°C (30°F), the following work practices should be followed:
 - If the clothing of a worker might become wet on the project, the outer layer of the clothing must be impermeable to water

- If a worker's underclothing becomes wet, the worker must change into dry clothing immediately; however, if the clothing becomes wet from sweating, the worker may finish the task that caused the sweating before changing into dry clothing
- Workers will be provided a warm area (18.3oC [65oF] or above) to change from work clothing into street clothing
- Workers will be provided a warm break area (15.6oC [60oF] or above)
- If appropriate, space heaters may be provided in the work area to warm the hands, feet, etc.
- Hot liquids, such as soups or sweet drinks, shall be provided in the break area; the intake of caffeine shall be limited because of diuretic and circulatory system effects
- The buddy system shall be practiced at all times; any personnel observed with severe shivering shall leave the cold area immediately
- Workers should layer their clothing (i.e., thinner, lighter clothing layered under heavier clothing)
- To prevent heat stress, workers should dress appropriately for going into warm areas or performing strenuous activities
- Workers handling liquids that evaporate easily (gasoline, diesel fuel, etc.) shall take special precautions to avoid soaking clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling
- Work shall be planned to minimize the need for workers to sit still or stand for long periods of time.

Additional cold weather hazards exist from working on snow- or ice-covered surfaces. Slip, fall and material handling hazards are increased under these conditions. Every effort must be made to ensure walking surfaces are kept clear of ice. The STR, PE, or HSO should be notified immediately if slip or fall hazards are noted at the INTEC sites.

8.4.2 Noise

Personnel working at the project may be exposed to noise levels that exceed 85 decibel as measured on an A-weighted scale (dBA) during an 8-hour time-weighted average (TWA) and 83 dBA for 10-hour TWA during the various stages of the tank farm interim action. The effects of high sound levels (noise) may include the following:

- Personnel being startled, distracted, or fatigued
- Physical damage to the ear, pain, and temporary or permanent hearing loss
- Interfere with communication that would warn of danger.

Noise measurements (using instruments listed in Table 8-4) will be performed by the IH per the *INEEL Safety and Health Manual* to determine if personnel assigned to the jobs identified are above

allowable noise exposure levels. A TLV of 85 dBA (time-weighted average) will be applied to personnel exposed to noise levels over no more than an 8-hour day. This level is based on a 16-hour "recovery" period in a low noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, then the TLV will be adjusted to a lower value. The project IH must be consulted regarding modifications to the 85 dBA 8-hour TLV and 83 dBA for 10-hour TWA value.

Personnel whose noise exposure meets or exceeds the allowable level will be enrolled in the INEEL OMP or subcontractor Hearing Conservation Program. Personnel working on jobs that have noise exposures greater than 85 dBA (83 dBA for 10-hour TWA), will be required to wear hearing protection until noise levels have been evaluated, and will continue to wear the hearing protection specified by the IH until directed otherwise.

8.4.3 Fire Hazards

Fire hazards at the project location include combustible materials near ignition sources (hot motor or exhaust system), transfer and storage of flammable or combustible liquids in the SZ, and chemical reaction (reduction, oxidation, exothermic, etc.) from incompatible waste materials. Portable fire extinguishers, with a minimum rating of 10A/60BC shall be strategically located at the project location to combat Class ABC fires. As needed, they will be located in all active work areas, on or near project equipment that have exhaust heat sources, and on or near all equipment capable of generating ignition or has the potential to spark.

Combustible or ignitable materials in contact with or near exhaust manifolds, catalytic converters, or other ignition sources could result in a fire. The project FPE will identify these sources as equipment is brought on the project. Class A combustibles such as, trash, cardboard, rags, wood, and plastic will be properly disposed in metal receptacles in the SZ and in appropriate waste containers within the CRC, CRZ and EZ/RBA.

Only approved flammable liquid containers, labeled with the content, will be used to store fuel. All fuel containers will be stored at least 15 m (50 ft) from any facilities (trailers) and ignition sources, or stored inside an approved flammable storage cabinet. Refueling tasks will only be conducted by qualified fuel handling personnel

8.4.4 Biological Hazards

The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project is located in an area that provides habitat for various rodents, insects, and reptiles. Based on biological studies done at the INEEL, deer mice have been known to carry the Hantavirus. The virus is present in the nesting and fecal matter of deer mice. A potential exists for project personnel to disturb nesting or fecal matter during the course of mobilization and intrusive activities. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Also, contact and improper removal of these materials may provide additional inhalation exposure risks.

If suspect rodent nesting or excrement material is encountered, the STR, PE, IH, and HSO will be notified immediately and no attempt shall be made to remove or clean the area. Following an evaluation of the area, a SWP will be written for disinfecting and removal of it from the project task area. The IH will provide the necessary guidance for protective equipment, mixing, and application of the disinfecting solution (bleach solution), and proper disposal method of the waste. Typical PPE for disinfecting and removal of a large nesting area may include full-face respirator with a HEPA filter cartridge, Tyvek coveralls, outer booties and two pair of gloves (latex inner-nitrile outer). Generally, all seams and mating/overlapping PPE ensemble pieces will be taped.

Snakes, insects, and arachnids (spiders, ticks, and mosquitoes) may also be encountered at INTEC. Common areas to avoid include material stacking/staging areas, under existing structures (trailers, buildings, etc.), under boxes, and other areas that provide shelter for snakes. Protective clothing will prevent insects from direct contact with personnel; however, repellent (DEET or equivalent) may be required during Level D activities. Areas where standing water has accumulated provide breeding grounds for mosquitoes and should be avoided. In cases where large areas of standing water is encountered, it may be necessary to pump it dry or add a small concentration of nonhazardous surfactant to the water to break the surface tension (mosquito hatching phases). Consult with the STR or PE and the environmental coordinator before adding surfactant to standing water areas.

8.4.5 Confined Spaces

Work in confined spaces (construction of lift station or trenching greater than 5 ft in depth) may subject personnel to risks involving engulfment, entrapment, oxygen deficiency, and toxic or explosive atmospheres.

Confined spaces are expected on this project.

Confined space will be treated as an entry permit required confined space unless a determination is made by an assigned safety/IH professional that the space is a confined space with no permit required. Entrances shall be posted with the required danger or caution sign per the *INEEL Safety and Health Manual*. A confined space entry permit is required before an employee can enter a confined space per the *INEEL Safety and Health Manual*.

8.4.6 Safety Hazards

Industrial safety hazards pose a significant, if not the most likely, threat to personnel that will be encountered while performing tasks at the INTEC sites. Section 6 of this HASP provided general safe-work practices that must be followed at all times. The following sections describe specific industrial safety hazards and procedures to be followed to eliminate or minimize potential hazards to project personnel.

8.4.6.1 Handling Heavy Objects. Handling and maneuvering of various pieces of heavy equipment may result in employee injury. Personnel shall not physically lift objects greater than 22 kg (50 lb) by themselves. Manual material handling will be minimized through task design and use of mechanical and/or hydraulic lifts whenever possible.

8.4.6.2 Powered Equipment and Tools. At the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, radiological release surveys will determine what equipment can leave the CA. All power equipment and tools will be properly maintained and used according to the manufacturer's specifications by qualified individuals. The *INEEL Safety and Health Manual* will be followed for all work performed with powered equipment including powered steam cleaners.

8.4.6.3 Heavy Equipment and Moving Machinery. The hazards associated with the operation of heavy equipment include injury to personnel, equipment damage, and/or property damage. All heavy equipment will be operated in the manner in which it was attended and according to manufacturer's instructions. Only authorized personnel will be allowed in the vicinity of operating heavy equipment and should maintain visual communication with the operator. Work-project personnel shall comply with the *INEEL Safety and Health Manual*.

Project personnel working around or near heavy equipment and other moving machinery shall comply with the appropriate INEEL *Safety and Health Manual* and DOE-STD-1090-96, *Hoisting and Rigging*. Additional safe practices will include

- All heavy equipment will have backup alarms.
- Walking directly in back of or to the side of heavy equipment without the operator's knowledge will be prohibited; all precautions will have been taken prior to moving heavy equipment.
- While operating heavy equipment in the work area, the equipment operator shall maintain communication with a designated person responsible for providing direct voice contact or approved standard hand signals; in addition, all project personnel in the immediate work area shall be made aware of the equipment operations.
- All equipment shall be kept out of traffic lanes and access ways when possible and shall be stored so as not to endanger personnel at any time.

8.4.6.4 Electrical Hazards/Energized Systems. Electrical equipment and tools as well as underground lines may pose shock or electrocution hazards to personnel. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. If work on energized systems is necessary, these practices will conform with the requirements in the INEEL *Safety and Health Manual*, INEEL *Operations Manual*, facility supplemental MCPs, and Parts I through III of National Fire Protection Association (NFPA) 70E. In addition, all electrical work will be reviewed and completed under the appropriate work controls (i.e., HASP, SWPs, work orders).

Before beginning any subsurface penetrations, underground utility clearances will be obtained by contacting telecommunications (526-1688 or 526-2512). Subsurface investigation clearance will be obtained in accordance with INEEL *Facilities and Maintenance Manual*. The requirements for advanced 48-hour notice will be met.

8.4.6.5 Personal Protective Equipment. Wearing PPE will reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Work activities at the project will be modified as necessary to ensure that personnel are able to work safely in the required PPE. Work-project personnel shall comply with the INEEL *Safety and Health Manual* and the INEEL *Radiological Control Manual*. The Tank Farm Interim Action PPE levels for each task are described in Section 9 and listed in Table 9-2 of this HASP.

8.4.6.6 Decontamination. Decontamination procedures for personnel and equipment are detailed in Section 10. Due to the unique nature of contamination at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, these Section 10 procedures will serve as the primary DECON method for all personnel and equipment that enters the EZ/RBA and radiologically controlled areas at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project. The appropriate MCPs provides additional requirements for chemical and radiological decontamination requirements.

Decontamination procedures (see Section 10 of this HASP) and applicable MCPs must be followed and the appropriate level of PPE worn during DECON activities. Project RadCon and IH personnel will follow the INEEL *Radiological Control Manual*, and the INEEL *Safety and Health Manual*, MCPs and general IH practices; for sampling activities the INTEC Sampling and Analysis plan will be followed.

8.4.7 Inclement Weather Conditions

When inclement or adverse weather conditions develop which may pose a threat to persons or property at the project (such as sustained strong winds 25 mph or greater), electrical storms, heavy precipitation, or extreme heat or cold) these conditions will be evaluated and a decision made by STR or PE, and JSS, with input from the HSO, IH, safety engineer, RCT, and other personnel, as appropriate, to stop work, employ compensatory measures, or to proceed. The STR, PE and JSS shall comply with MCPs and project work control documents that specify limits for inclement weather.

During all project activities for the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, RadCon and IH personnel will determine if wind or other weather conditions pose unacceptable hazards to personnel or the environment.

8.5 Other Project Hazards

Project personnel should continually look for potential hazards and immediately inform the STR, PE, or HSO of the hazards so that action can be taken to correct the condition.

The STR or PE, HSO, RCT, and JSS will conduct periodic inspections of the project to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the projects. These inspections will be noted in the STR and PE logbook. Health and safety professionals present at the project may, at any time, recommend changes in work habits to the STR or PE. However, all changes that may affect the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project written work control documents (HASP, RWPs, SWPs), must have concurrence from the appropriate project technical discipline representative on project and a Data Analysis Report (DAR) prepared as required.

Personnel working at the project are responsible to use safe-work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job.

9. PERSONAL PROTECTIVE EQUIPMENT

The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project pose potential hazards to personnel from the nature of the Group 1 Tank Farm Interim action, and from industrial safety hazards (moving equipment and vehicles). Anyone entering the CRZ and EZ/RBA must be protected against these potential hazards. The purpose of PPE is to shield or isolate personnel from chemical, radiological, physical, or biological hazards that cannot be eliminated through engineering or other controls but may be encountered. It is important to realize that no PPE ensemble can protect against all hazards under all conditions and that work practices and adequate training will also provide a greater level of protection to workers.

Note: *Non-project personnel are not permitted in the EZ/RBA without proper escort and satisfying the appropriate training requirements for being in the EZ/RBA.*

Selection of the proper PPE to protect the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project personnel is based on

- WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project tasks to be conducted (mobilization, etc.)
- Known or suspected radiological and nonradiological materials and agents expected to be found at the project
- Potential contaminant routes of entry
- Physical form and chemical characteristics of contaminants
- Acute and chronic effects from exposure to contaminants
- Local and systemic toxicity of contaminants
- Anticipated exposure levels (surface and airborne)
- The Hazard Analysis (Section 8) evaluation of this HASP.

Anti-contamination (Anti-C) requirements are dictated by RWP in conformance with the *Radiation Protection Manual* and MCP-432, "Radiological Personal Protective Equipment."

The PPE is generally divided into two broad categories: (1) respiratory protective equipment and (2) personal protective clothing. Both of these categories are incorporated into the standard four levels of protection (Levels A, B, C, and D), based on the potential severity of the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project hazards. Table 9-1 provides guidance in the selection process for respiratory and protective clothing. The Tank Farm Interim Action project-specific hazards and contaminants will be evaluated in determining the most appropriate PPE level and modifications.

9.1 Respiratory Protection

Several of the radiological and nonradiological contaminants of the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action, as well as the polyurea surface covering, presents a significant potential respiratory hazard if released in an airborne respirable form. Table 8-2 of this HASP presented the

Table 9-1. Respiratory and protective clothing selection.

Respiratory PPE Selection ^a		
Hazard	Level of Protection	
Not immediately dangerous to life or health (IDLH) or oxygen-deficient atmospheric conditions. Gaseous, vapor, particulate and/or aerosol chemicals/radionuclides.	Level C—full-facepiece Level B—full-facepiece supplied air respirator with an air-purifying escape cartridge or airhood (bubblehood) HEPA/chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator and within the assigned DAC ^b value	
IDLH or oxygen-deficient atmospheric conditions. Gaseous, vapor, particulate and/or aerosol chemicals/radionuclides.	Level B—full-facepiece, supplied air respirator with an escape-only SCBA ^c or HEPA/chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator and within the assigned DAC ^b value	
Protective Clothing Selection		
Low atmospheric contaminant levels that are present under stable conditions. No anticipated immersion, splashes or potential for unexpected contact with chemical or radiological contaminants.		Level D
Moderate atmospheric contaminants under relatively stable conditions, liquid splashes or other direct contact that do not have corrosive characteristics or can be absorbed by exposed skin. Low radiological contamination and airborne radioactivity levels. ^d		Level C
Moderate to high atmospheric contaminants under unstable conditions, potential for contact with wet, contaminated surfaces/material that can saturate or permeate Level C protective clothing. Moderate radiological contamination and airborne radioactivity levels. ^d This level is anticipated during nitric acid work as determined appropriate by the project IH.		Level B
High and unknown atmospheric contaminants, potential for contact with substances that pose a high hazard potential to the skin, high potential for splash, immersion or exposure to unexpected vapors, gases, aerosols, or dusts that may present an IDLH situation/readily absorbed through the skin. High radiological contamination and airborne radioactivity levels. ^d		Level A

a. A multichemical/HEPA combination cartridge to be selected by IH and RadCon personnel based on specific task hazards.

b. Derived air concentration (DAC) based on specific radionuclides.

c. SCBA = self-contained breathing apparatus.

d. Contamination levels and airborne radioactivity as defined by 10 CFR 835.603.d., e., f.

contaminants and exposure potential based on the tasks to be completed, amount and form of hazardous constituents, engineering controls that will be implemented, and containerized nature of core retrieved material. This evaluation concluded that the primary potential respiratory hazards will be from airborne radioactivity and organic vapors. Therefore, the type of respiratory protection required for this project is based on these primary potential respiratory hazards. Level B protection will be used, at a minimum, during polyurea spraying applications and nitric acid (and other trace compounds) tracking, repair work associated with nitric acid work, hand excavation in near proximity to nitric acid, and clean-up activities associated with the nitric acid sludge unless downgraded by the IH.

The level and type of respiratory protection is project-specific and relates directly to the airborne hazards for each given task or activity. Task-based respiratory protection and protective clothing required are listed in Table 9-2. Required levels of respiratory protection will vary based on specific tasks. Personnel will not exceed the assigned protection factors (APFs) of the respiratory devices listed in Table 9-3.

All personnel required to wear respirators shall complete training and be fit-tested before being assigned a respirator per the training and documentation requirements in Section 4 of this HASP. Requirements for respirator use, emergency use, storage, cleaning, and maintenance, as stated in the *INEEL Safety and Health Manual* shall be followed.

9.2 Personal Protective Equipment Levels

The following sections provide detail and explanation of the four levels of PPE. Modifications to these levels shall be made under the direction of the HSO in consultation with the project IH and RadCon personnel, as appropriate. Such modifications are routinely employed during HAZWOPER project activities to maximize efficiency and to meet project-specific needs without compromising personnel safety and health. Due to the possibility of low level radionuclide contamination that will be encountered at the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, special attention will be given to protective clothing to meet specific task requirements. Level B or C PPE is required for most of the work for this HASP. Although it is not anticipated, Level D PPE may be required for some tasks as determined by the IH and RCT. The HSO, IH, and RadCon will determine what modifications are appropriate to the PPE levels listed in Table 9-2. Level B protection will be worn, at a minimum, during polyurea spray applications unless downgraded by the project HSO, IH, and RCT.

Note: *Personnel must inspect all PPE before donning and entry into any work zone. Items found to be defective or that become unserviceable during use, will be doffed and disposed in accordance with posted procedures and placed into the appropriate waste stream. PPE inspection guidance is provided in Section 9.5 of this HASP.*

9.2.1 Level D Personal Protective Equipment

Level D PPE will only be selected as a work uniform and not on a project with respiratory or skin absorption hazards requiring whole body protection. It provides no protection against airborne chemical hazards, but rather is used for protection against nuisance contamination and physical hazards. Level D PPE will only be allowed in areas that have been characterized or are known to have never been contaminated. At the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, Level D PPE is for all tasks where it has been determined AL will not be exceeded inside the EZ/RBA, and SZ activities. Based on the hazard analysis, the PPE is Level D with a possible need for Level C, and anti-Cs as specified by the task RWP and applicable job specific ES&H requirements. The Level D PPE ensemble may be modified or upgraded by the IH and/or RCT to provide protection from skin and physical hazards, but not respiratory protection. Basic Level D PPE consists of the following:

- Coveralls or work clothes (as determined by the IH, RCT).
- Hard hat (as required by SE and type of work being performed).
- Eye protection, safety glasses with side shields as a minimum (see the *INEEL Safety and Health Manual*).

Table 9-2. The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action projects task-based PPE requirements and modifications.

Task or Assignment	Level of PPE	Modifications and Comments
1. Mobilization	Level D	None
2. Surveying excavation areas	Level B or C	Anti-C as specified by the RCT/shoe covers and gloves ^a
3. Excavating with heavy or light equipment	Level B or C	Anti-C as specified by the RCT/shoe covers and gloves ^a
4. Excavating by hand	Level B or C	Anti-C as specified by the RCT/ Tyvek or cloth coveralls, shoe covers and gloves ^a
5. Polyurea coating	Level B or C	Anti-C as specified by the RCT/ Tyvek or cloth coveralls, shoe covers and gloves ^a
6. Decontamination	Level B or C	Anti-C as specified by the RCT/ Tyvek or cloth coveralls, shoe covers and gloves ^a
7. Nitric acid characterization, source identification, sampling, possible system repair, and clean-up activities.	Level B	Anti-C as specified by the RCT/acid-resistant suit (Saranex-23C or equivalent), acid-resistant booties, gloves, air-line respiratory protection (escape bottle if IDLH anticipated)
8. Demobilization	Level D	None

a. Only for areas with chemical contaminants as specified by IH. Anti-Cs will be as specified by the RCT in all areas.

- Safety footwear (steel or protective toe and shank, as determined by the SE).
- Optional Level D Modifications consists of the following:
 - Chemical or radiological protective clothing (Tyvek, Saranex, etc.) as prescribed in project-specific RWP or SWP
 - Chemically resistant hand and foot protection (inner/outer gloves, boot liners, etc.)
 - Radiological modesty garments under outer protective clothing
 - Any specialized protective equipment (hearing protection, cryogenic gloves, face shields, welding goggles, aprons, etc.).

Table 9-3. Assigned respiratory protection factors.^a

Type of Respirator	Respiratory Inlet Covering (full facepiece)	
Air-purifying	Chemical Agents 100	Radionuclides 100 ^{b,c}
<u>Atmosphere Supplying</u>		
Airline and SCBA (demand mode)	Chemical Agents 100	Radionuclides 100 ^c
Airhood (continuous flow mode – 6 CFM to hood minimum)	1,000	1,000 ^c
Airline (pressure demand and continuous flow mode)	1,000	1,000 ^c
SCBA (pressure demand, open/closed circuit)	Chemical Agents See below ^d	Radionuclides 10,000

a. ANSI Z88.2-1998.

b. Particulates only. When HEPA filters are used in atmospheres not containing radioactive gas.

c. MCP-432

d. Although positive pressure respirators are currently regarded as providing the highest level of respiratory protection, recent simulated workplace studies concluded that all users may not achieve protection factors of 10,000. Based on this limited data, a definitive APF could not be listed for positive pressure SCBAs. For emergency planning purposes where hazardous concentrations can be established, an APF of no higher than 10,000 should be used.

9.2.2 Level C Personal Protective Equipment

Level C PPE shall be worn when the project chemical and/or radiological contaminants have been well-characterized indicating that personnel are protected from airborne exposures by wearing air-purifying respirators (APRs) with the appropriate cartridges, no oxygen-deficient environments exist (<19.5% at sea level), and that there are no conditions that pose immediate danger to life or health (IDLH). Basic Level C PPE shall include

- Level D ensemble with the following respiratory and whole body protection upgrades:
 - Full-facepiece APR equipped with a NIOSH approved HEPA/chemical combination cartridge (IH to specify chemical combination cartridge)
 - Chemical-resistant coveralls (Tyvek QC®, Tychem 7500®, Saranex-23-P™, etc.) as prescribed in project-specific RWP or SWP (IH to specify material)
 - Chemical-resistant outer shoe/boot cover (IH or RCT to specify material)
 - Inner chemical-resistant nitrile rubber gloves with cotton liners (as determined by the IH and/or RCT)
 - Outer chemical-resistant Viton or polyvinyl alcohol (PVA) gloves (as determined by the IH)

- Optional Level C modifications as follows:
 - Radiological modesty garments under outer protective clothing
 - Any specialized protective equipment (hearing protection, welding lens, aprons, etc.).

9.2.3 Level B Personal Protective Equipment

Level B PPE is anticipated during polyurea application and nitric acid work and shall be worn when personnel cannot be adequately protected with air-purifying respirators because there are high levels of contaminants present, the appropriate respirator cartridges or combination is not available, a significant hazard exists for skin exposure, or IDLH/oxygen-deficient conditions exist. If IDLH conditions do not exist, then an escape air-purifying cartridge may be substituted for the escape bottle. Level B PPE includes

- Level C ensemble with the following respiratory and whole body protection upgrades:
 - An airhood operating at a minimum pressure of 6 cubic cfm or a full-facepiece SAR with a 10-minute escape bottle, a self-contained breathing apparatus (SCBA) or an escape air-purifying combination HEPA/chemical cartridge (SAR hose length no more manufacturer's specification and under no circumstances greater than 91 m [300 ft])
 - Chemical-resistant coveralls or encapsulating suit (Tyvek QC®, Tychem 7500®, Saranex 23-C™ or equivalent)
 - Any other chemical or radiological PPE prescribed in project-specific RWP or SWP
 - Chemical-resistant butyl or one-time-use natural latex outer boots (as determined by the IH and/or RCT)
 - Inner chemical-resistant nitrile rubber gloves with cotton liners (as determined by the IH and/or RCT)
 - Outer chemical-resistant Viton or PVA gloves (as determined by the IH)
- Optional Level B modifications include the following:
 - Radiological modesty garments under outer protective clothing
 - Any specialized protective equipment (hearing protection, welding lens, aprons, etc.).

Note: *All seams must be taped and secured to prevent skin contact from hazardous substances in a soil, liquid, mist, and aerosolized form.*

9.3 Protective Clothing Upgrading and Downgrading

The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project HSO, in consultation with the project IH and RadCon personnel, will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE requirements based on current conditions is a

normal occurrence. Action levels listed in Table 8-5 in Section 8 of this HASP provide the basis for determining such decisions. Additional reasons for upgrading or downgrading include

Note: *When upgrading or downgrading PPE requirements for radiological conditions, a new RWP task must be issued if an applicable RWP task does not already exist.*

- Upgrading criteria (work will stop immediately if PPE upgrading is required):
 - Unstable or unpredictable project radiological and/or nonradiological hazards
 - Contaminants that present difficulty in monitoring or detecting
 - Known or suspected presence of skin absorption hazards
 - Temporary loss or failure of any engineering controls
 - Identified source or potential source of respiratory hazard(s)
 - Change in the task procedure that may result in an increased contact with contaminants or meeting any of the criteria listed above
- Downgrading criteria:
 - New information of monitoring data that shows the contaminant levels to be lower than established action limits
 - Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazards
 - Elimination of potential skin absorption or contact hazards
 - Change in project conditions that results in removal of physical hazards or reduces/isolates them to a controlled area
 - Completion or change in tasks that results in the elimination of key hazards that requires higher levels of PPE.

Table 9-2 of this HASP lists each task or assignment and the corresponding level of PPE, as well as any additional or special items necessary for personal protection at the project.

9.4 Inspection of PPE

All PPE ensemble components must be inspected prior to use and when in use within the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project work zones. Self-inspection and the use of the buddy system, once PPE is donned, will serve as the principle forms of inspection. If at any time PPE should become damaged or degradation/permeation is suspected, an individual will inform others of the problem and proceed directly to the work zone exit point to doff and replace the unserviceable equipment. Additionally, all PPE that becomes grossly contaminated or presents a potential source for the spread of such contamination, will be required to be decontaminated or replaced. Table 9-4 provides an inspection checklist for common PPE items.

Table 9-4. PPE inspection checklist.

PPE Item	Inspection
Gloves	<p>Before use:</p> <ul style="list-style-type: none">• Pressurize gloves to check for pinholes, blow in the glove, then roll until air is trapped and inspect. No air should escape.
Respirators (full-facepiece air-purifying and supplied air respirators with escape-only SCBA bottles or escape cartridges)	<p>Before use:</p> <ul style="list-style-type: none">• Airline matches the airline respirator to be used (black hose).• Inspect airline hose connections (sections of hose) to ensure all are threaded or permanent metal-to-metal connections (no quick disconnect pieces).• Check condition of the facepiece, head straps, valves, connecting lines, fittings, all connections for tightness.• Check cartridge to ensure proper type/combination for atmospheric hazards to be encountered, inspect threads and O-rings for pliability, deterioration, and distortion.• Check for proper setting and operation of regulators and valves, check all hose connections back to the breathing air compressor, check the pressure to the airline station, and on individual airline connections to ensure pressure is within required range (in accordance with the manufacturer's specification). <p>Before entry into Level B area:</p> <ul style="list-style-type: none">• Ensure air compressor is providing a minimum of 110 psi when all personnel have airlines hooked up to compressor manifold.

Table 9-4. (continued).

PPE Item	Inspection
Airhoods	<p>Before use:</p> <ul style="list-style-type: none"> • Airline matches the airhood to be used (red hose). • Airhood is within 3 year shelf life (for polyvinyl chloride (PVC) components). • Visually inspect all seams and surfaces for tears, cracks, etc. • Pressurize airhood to check for pinholes or defective seams (no air should leak out when choking clear hood piece). <p>Before entry into CA:</p> <ul style="list-style-type: none"> • Inspect all airline connections for tight fit (pull connections 3 times). • Ensure air compressor is providing a minimum of 110 psi when all personnel have airlines hooked up to compressor manifold.
Level D, C, and B clothing	<p>Before use:</p> <ul style="list-style-type: none"> • Visually inspect for imperfect seams, non-uniform coatings, tears, etc. Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks. <p>While wearing in the work zone:</p> <ul style="list-style-type: none"> • Evidence of chemical attack, such as discoloration, swelling, softening and material degradation. Inspect for tears, punctures, and zipper or seam damage. Check all taped areas to ensure they are still intact.
Level A encapsulating suit	<p>Before use:</p> <ul style="list-style-type: none"> • Same item as with other protective clothing, with the addition of checking the operation of the pressure relief valve, inspect fitting of wrists, ankles and neck. Inspect face shield for cracks, fogginess, scratches, and crazing. <p>While wearing in the work zone:</p> <ul style="list-style-type: none"> • Same as other protective clothing.

10. DECONTAMINATION PROCEDURES

Every effort will be made to prevent contamination of personnel and equipment through the use of engineering controls, isolation of source materials, continuous project monitoring and surveying, personnel contamination control training, and by following all contaminated material handling requirements and procedures.

10.1 Contamination Control and Prevention

Everything that enters the established contamination area (CA) has the potential of becoming contaminated. Contamination control and prevention procedures will be implemented throughout the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project to minimize personnel contact with contaminated surfaces. At the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project, the following contamination control and prevention measures will be employed:

- Identifying potential sources of contamination and design containment, isolation, and engineering controls to eliminate or mitigate any potential for contact or release of contaminants
- Limiting the number of personnel, equipment, and materials that enter the contamination area
- If contamination is found on outer surfaces (of equipment), immediate decontamination procedures will be implemented to prevent the spread of contamination (see Section 10.2.2 of this HASP)
- Utilizing only the established control entry and exit point from the contamination area to minimize the potential for cross-contamination and expedite contamination control surveys
- Wearing disposable outer garments and utilizing disposable equipment (where possible).

10.2 Personnel and Equipment Decontamination

Decontamination procedures for personnel and equipment are necessary to control contamination and protect personnel. Both chemical and radiological contamination will be decontaminated from surfaces at the exit from the contamination area and other work zone transition boundaries (CRZ for nonradiological nonhazardous materials, as appropriate).

All radiological and mixed hazardous substance decontamination tasks will be performed in Level B PPE ensemble initially. All radiological decontamination operations for equipment and areas shall be performed in accordance with Chapter 4 of the INEEL *Radiological Control Manual*. Nonradiological decontamination will be evaluated on a case-by-case basis by the HSO and project IH to determine the most appropriate PPE. It is not expected that nonradiological contamination will be present without some detectable radiological contaminants. Specific personnel and equipment decontamination methods are provided in the following subsections.

10.2.1 Personnel Decontamination

Engineering controls in conjunction with project contamination prevention and control practices, and proper protective clothing donning and doffing procedures will serve as the primary means to

eliminate the need for personnel decontamination. Procedures for donning and doffing protective clothing will be posted at the entrance and exit to all radiological contamination areas established. Prior to donning PPE, all items will be inspected following the list in Table 9-4 in Section 9 of this HASP. Following the donning of protective clothing, the employee buddy, the STR, PE, HSO, and/or RCT will check to verify proper donning technique. The greatest potential for personnel contamination exists when excavating soils and from improper doffing of contaminated protective equipment (during a containment failure scenario only) when exiting a contamination area.

The PPE selection, as identified in the RWP/SWP, will provide for the layered barriers required to prevent permeation and minimize external surface contamination. The options for the outermost protective clothing layer (Tyvek QC™, Saranex-23C®, etc.) will depend on the likelihood for deposition of contaminants and the specific tasks, as listed in Table 9-2 of this HASP.

10.2.2 Decontamination in Medical Emergencies

If a person is injured or becomes ill, they will immediately be evaluated by first aid trained personnel at the INTEC sites. If serious, then the STR/PE will contact the Warning Communications Center (WCC) to summon emergency services (fire department and CFA Medical) to the project. Also, the INTEC plant shift supervisor and others will be contacted, as stated in Section 11 of this HASP.

Medical care for serious injury or illness will not be delayed for decontamination. In such cases, removal of gross contamination may be conducted by removing the injured person's outer protective clothing (if possible) and other contaminated areas contained with a bag, glove, etc. If contaminated PPE cannot be removed without causing further injury (except for the respirator, which must be removed), the individual will be wrapped in plastic, blankets or available material to help prevent contaminating the inside of the ambulance, medical equipment and medical personnel. The IH and/or RCT (depending on the type of contamination) shall accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Contaminated PPE will then be removed at the CFA medical facility and carefully handled to prevent the spread of contamination. The INEEL *Radiological Control Manual* contains information on proper handling of radionuclide-contaminated wounds.

10.2.3 Equipment Decontamination

Containment engineering and isolation controls have been designed to prevent contamination from WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action waste. These engineering controls will serve to isolate and eliminate or mitigate many of the potential contamination pathways to prevent equipment contamination and greatly reduce the need for decontamination.

Both real-time instrumentation and visual observation will be used to detect contamination within and beyond the work areas for the Group 1 Tank Farm Interim Action. Equipment and personnel decontamination will use both instrumentation and visual methods for contamination detection and to minimize the potential spread and airborne generation of contaminants. Where radiological and IH concerns do not prohibit their use, INEEL *Environmental Manual Technical Procedures* will be followed. RadCon and IH personnel will evaluate any contaminated equipment to determine the most appropriate decontamination method based on the nature of the contaminated item, level of contamination, required effort to decontaminate the item, and requirement for decontaminating versus disposing of such items. In some cases, the level of effort and potential for spreading contamination from conducting decontamination tasks far outweigh the benefit from engaging in extensive decontamination efforts to return an item to service. An ALARA versus cost benefit evaluation will be done on items that have extensive contamination or are relatively inexpensive. Low-cost consumable items will be discarded if

initial decontamination efforts fail or extensive decontamination is required that is not in accordance with ALARA principles.

For nonradiological decontamination of free released equipment, a decontamination pad may be established in the CRC. If it is deemed necessary and appropriate by the INTEC project IH, then a wet wiping with the aforementioned amended water solution, or potentially steam cleaning of this equipment prior to leaving the CRC may be conducted. If steam cleaning is performed, a drainage system that allows for a single collection point will be established. Decontamination wastewater will be collected using a submersible pump and containerized/characterized in accordance with the INEEL *Environmental Management Procedures Manual*.

10.2.3.1 Large Area Surface Contamination. It is not anticipated that large area decontamination will be required with the use of project engineering controls, isolation methods, and contamination control practices.

10.3 Doffing PPE and Decontamination

The proposed decontamination strategy takes into account the most restrictive radiological practices (removable alpha contamination) and allowances for chemical contaminants that may be present. Some preliminary surface decontamination of protective clothing may be required if they are grossly contaminated and the potential for the generation of airborne radioactivity or organic vapor emissions exists. This will involve assistance from other personnel inside the contamination area and at the doffing station as described below. The ultimate goal of all decontamination methods is to effectively and efficiently isolate the source of contamination through removal of protective clothing and containment in a sealed bag or waste container.

The exact sequence and specific techniques that follow are provided as the initial method at the INTEC sites. If project conditions change or at the discretion of the project radiological engineer, modifications to this procedure are appropriate. However, the HSO and IH must also evaluate any modification. Both radiological and nonradiological (chemical) hazards will be evaluated. Modifications to this procedure will be documented and authorized for issuance in accordance with company procedures.

10.3.1 Level B and C PPE Decontamination (Double Step-off Pads)

When Level B or C PPE are worn, two step-off pads may be used at the project: (1) one at the line between the CA and the second step-off pad (step-off [SP] Pad 1), and (2) the second at the line between Pad 1 and Pad 2. These will both be within the EZ/RBA and the RBA. Any gross contamination identified (visually and during normal monitoring) will be covered with tape and plastic or decontaminated (HEPA vacuum, spray/wipe or combination of both) prior to entering step-off Pad 1 to minimize the spread of contamination. Acid contamination on acid-resistant suits may include appropriate water rinse in approved collection container adequate for decontamination, containment, and ease of disposal.

10.3.1.1 Contamination Area. Initial decontamination through removing the outer set of protective clothing (anti-Cs of appropriate material), along with supplemental dosimetry, following the posted sequence. Doffing of the outer set of protective clothing will occur at the exit to the CA. Prior to entering the Pad 1 area, personnel will leave all tools and equipment inside the CA (bagged as required) and remove the outer most layer of clothing (third layer), gloves and shoe covers (scuffs) and place them in the provided receptacles. Personnel will then proceed to step-off Pad 1 (SP-1) with their respiratory protection (airhood) still on and the airline connected.

10.3.1.2 Step-off Pad 1. Step-off-1 is designed to support personnel exiting the contamination area and serve as a radiologically controlled area to complete the doffing sequences. Personnel will remove the inner layer of protective clothing and disconnect/remove airhoods in SP-1. Airline hose connections will then be sealed by covering ends with a latex glove and tape, and will be placed in a RadCon survey box located adjacent to SP-1. This pad may also be used for decon activities associated with nitric acid activities.

An air-monitoring inlet will be located inside the SP area to monitor for airborne radioactivity and ensure respiratory protection can safely be removed. Following prescribed SP-1 doffing, personnel will then proceed to SP-2.

10.3.1.3 Step-off Pad 2. The SP-2 serves as the final step-off pad and all PPE will be removed as personnel cross over into SP-2. While inside SP-1 (with only the inner gloves and booties on) personnel will remove the remaining PPE items and step across the line into the SP-2 (1 ft at a time as posted). All personnel will then be required to complete a whole body survey with a hand-held radiation detection instrument (as listed in Table 8-6 of this HASP) while in SP-2. The sequence for this survey is detailed in Section 10.3.2. Personnel will then proceed directly to the personnel contamination monitor (located at the EZ/RBA boundary).

10.3.1.4 Radiological Buffer Area. The RBA serves as the radiologically controlled area around the entire WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project contamination area that provides a secondary boundary to minimize the potential spread of contamination.

10.4 Disposal of Contaminated PPE and Equipment

10.4.1 Storage and Disposal of Contaminated Materials

The potential exists for the generation of a substantial volume of IDW for pre-ROD waste or remediation generated waste for post-ROD waste from WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action activities. Sources of this waste may include

- Used PPE (protective clothing, gloves, booties, respirators, etc.)
- Small tools and equipment that cannot or will not be decontaminated/released
- Radiologically controlled area materials (step-off pads, bags, swipes, plastic sheeting)
- Decontamination waste (wipes, bags, etc.)
- Miscellaneous debris that cannot be released (Lexan, caps, lines, etc.).

Equipment that cannot be decontaminated will be bagged, labeled, and containerized in accordance with the INEEL *Radiological Control Manual* and CERCLA requirements, and placed in an appropriately posted radiological and/or CERCLA storage area at the INTEC sites (area of contamination). The *Waste Management Plan* of the WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action Work Plan provides a description on how this material will be characterized, managed, and disposed. All IDW generated from sampling and in the decontamination process (if required) must be handled and disposed in accordance with INEEL *Environmental MCPs*, *ER Waste Certification Plans*, the INEEL *Radiological Control Manual*, and receiving facility waste acceptance criteria (WAC) (off-Site) or INEEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC) requirements.

10.4.2 Project Sanitation and Waste Minimization

The INTEC site personnel will use toilet facilities located inside the administrative area of the INTEC. Potable water and soap will also be available at the INTEC facilities for personnel to wash their hands and face upon exiting the work area.

Waste materials will not be allowed to accumulate at the project. Appropriate containers for contaminated and noncontaminated waste will be maintained at step-off areas, in the SZ, and at other appropriate locations at the project. All waste will be surveyed by the RCT before removal from the project. Personnel should make every attempt to minimize waste through judicious use of consumable materials. All project personnel are expected to make good housekeeping a priority at the project.

11. EMERGENCY RESPONSE PLAN FOR WAG 3, OU 3-13, GROUP 1 SOILS TANK FARM INTERIM ACTION PHASE 1 & 2 PROJECT

This section defines the responsibilities of project and the INEEL ERO by providing guidance for responding to abnormal events during project activity.

This emergency response plan addresses OSHA “emergency response” as defined by 29 CFR 1910.120/1926.65, *Hazardous Waste Operations and Emergency Response* and DOE “emergencies” as defined by DOE Order 151.1, Change 2, “DOE Comprehensive Emergency Management System,” and DOE Order 232.1, “Occurrence Reporting and Processing of Operations Information.” This response plan is implemented in concert with PLN-114, “INEEL Emergency Plan/RCRA Contingency Plan.”

The INEEL Emergency Plan/RCRA Contingency Plan may be activated in response to events occurring at the INTEC, or at the discretion of the EAM. Once the INEEL plan is activated project personnel will follow the direction and guidance communicated by the EAM.

Note: *The OSHA term “emergency” is not defined the same as the DOE term “emergency.” For simplicity, the term “emergency” is used in this section of the HASP to refer to events covered by either the OSHA or the DOE definition.*

The INTEC emergency preparedness plan will be in place before any project activity begins. Preplanning makes it possible for the project to anticipate and appropriately respond to abnormal events that can affect project activity. Preplanning also ensures that the project emergency response program is integrated with that of the INEEL or INTEC. Emergency response program elements that must be completed before starting the project include

- Designating emergency warning signals and evacuation routes
- Implementing personnel accountability procedures
- Identifying emergency medical services and the personnel charged with performing those services
- Establishing effective project communications
- Establishing requirements for emergency equipment and supplies
- Establishing the preferred means for notifying the INEEL ERO of abnormal events.

All emergencies will be reported through the INTEC plant SS for classification in accordance with Section 4 of the INEEL *Emergency Plan/RCRA Contingency Plan*, Addendum 2 (PLN-114-2). If the INTEC ERO is activated, project emergency response will follow the INEEL Emergency Plan/RCRA Contingency Plan, Addendum 2.

On-scene response to and mitigation of project emergencies could require the expertise of both project personnel and INEEL fire department personnel. Emergencies that could occur include

- Accidents resulting in injury

- Accidents resulting in radiological exposure
- Fires
- Explosions
- Spills of hazardous/radiological materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Safeguard and security emergencies
- Emergencies at nearby facilities that could prompt evacuation or take-cover actions at the project.

11.1 Types of Emergency Events

Note: *This HASP addresses three types of emergency events as described in the following sections.*

11.1.1 Events Requiring Emergency Notification

Certain events require courtesy notification but do not require a response from the INEEL ERO. In these cases the project STR or designee will immediately notify the INTEC plant SS, WCC, BBWL/subcontractor project and department personnel, DOE, and other appropriate parties as listed in Section 11.8 of this HASP. The STR's notification should describe the event (see Section 11.5.3 of this HASP) and state that no emergency response support is required. Examples of these types of events include, but are not limited to, the following:

- Personal injury at the projects requiring medical evaluation or treatment but does not require an ambulance response
- Personnel contamination or suspected uptake of radiological or hazardous substance
- Equipment or vehicle accident that results in damage to the vehicle and/or property ONLY
- Failure of an engineering control or isolation that results in only localized contamination within the established radiologically controlled area
- Unexpected high radiation dose to personnel (>ALARA goal)
- Small fire that is controlled with a hand-held fire extinguisher
- Any spill as defined by MCP-439, "Facility Notification and Release Reporting"
- Any other deemed potentially reportable.

11.1.2 Events Requiring Local Project Evacuation and/or INEEL ERO Response

Some events that could occur at the project or at INTEC may require support from the INEEL ERO or may require a local area evacuation of the project. In these cases the project STR or designee, who is the appointed project area warden, will immediately notify the INTEC plant shift supervisor, the WCC, BBWI/subcontractor project and department personnel, DOE, and other appropriate parties as listed in Section 11.8. The STR's notification will describe the event (see Section 11.3 of this HASP) and will request emergency response resources as appropriate. After being informed of the event, the EAM may elect to activate the facility emergency control center. Once the emergency control center is declared operational, all emergency response activities will be coordinated through the EAM. The specific actions to be taken in response to emergency alarms are described in Section 11.5 of this HASP. Examples of these types of events include, but are not limited to, those listed below:

- Fire that is burning beyond an incipient stage and cannot be extinguished with hand-held extinguishers
- Large spill at the project that cannot be immediately contained or controlled
- Small episodic airborne release beyond the radiologically controlled area
- Serious injury to a worker or workers.

11.1.3 Events Requiring Total Facility and Project Evacuation

In the event that a facility evacuation requires the project to evacuate, the STR or designee shall be notified to evacuate all project personnel. The EAM is responsible for ordering a total area evacuation protective action.

Note: *When an evacuation is called for by the EAM, the STR is the designated project area warden who will ensure that the ERO area warden coordinator has been notified that all project employees have been evacuated and accounted for.*

11.2 Emergency Facilities and Equipment

Emergency response equipment that will be maintained at the projects includes the items described in Table 11-1 of this HASP. Addendum 2 to the *INEEL Emergency Plan* (LMITCO 1999a) lists emergency equipment available at the INTEC. In addition Section 11 of the *INEEL Emergency Plan* lists INEEL emergency equipment available. The INEEL fire department maintains an emergency HAZMAT response van that can be used to respond to an event or emergency at the project. Fire department personnel are also trained to provide immediate hazardous material spills and medical services. At least two persons with current medic/first-aid training will be present at the project to render first aid as required.

Project RadCon and IH personnel will assist with all emergency decontamination efforts. If an emergency at this project involves a temporary accumulation area (TAA), refer to the INEEL Emergency Plan/RCRA Contingency Plan, Addendum 2, Appendix L for emergency equipment inventory information for the particular TAA (LMITCO 1999a).

Table 11-1. Emergency response equipment to be maintained at the project location.

Equipment Name and Quantity Required	Location at Project	Responsible Person	Frequency of Inspection
Fire extinguishers ^a	40 lbs. ABC extinguisher, one in each support zone and field trailer or support vehicle	HSO/PE/STR	Monthly
First aid supplies	Support zone	HSO/PE/STR	Monthly and after each use
Eyewash station	Support zone	HSO/PE/STR	Weekly
Hazardous materials spill kit	On vehicles or at project	HSO/PE/STR	Weekly
Communication equipment available	At project	PE	Daily
Extra PPE	At project	HSO/PE/STR	Daily

a. Consult the assigned project safety and fire protection engineer to determine appropriate type and quantity of fire extinguisher(s).

11.3 Emergency Communications

In the event of an emergency, the capability to summon INEEL emergency response resources, to immediately notify project personnel, and to inform others of project emergencies is required. Communications equipment at the project will be a combination of pagers, radio (call sign "KID 240 or talk group "IEN/(D)") telephones (mobile, cellular, or facility).

Note: When trunk units are used, the response organization can be reached via AINELOSC@ (the talk group).

The following, as necessary, will be used for emergency situations:

- To get help from the INEEL fire department, project personnel will use radio frequency kid 240 or will call 777, which is the INEEL site emergency telephone number, or 526-1515, which is the warning communication center. INEEL facility telephones are linked to 777. The 777 number cannot be reached on mobile or cellular telephones. If mobile or cellular telephones are used, calls must go to the INEEL Warning Communication Center at 526-1515.
- The INTEC plant shift supervisor will be notified.
- The INTEC STR plant shift supervisor will notify the INTEC emergency response organization.

Project personnel will provide the following information, as available, when communicating emergency information to the INEEL site emergency telephone number, the WCC, or the point of contact:

- The caller's name, telephone number, pager number

- Exact location of the emergency
- Nature of the emergency including time of occurrence, current project conditions, and special hazards in the area
- Injuries, if any, including numbers of injured, types of injuries, conditions of injured
- Additional information as requested.

11.4 Emergency Response Roles and Responsibilities

11.4.1 INEEL and INTEC Emergency Response Organizations

The INEEL ERO structure is based on the Incident Command System (ICS). The ICS is an emergency management system designed for use from the time an incident occurs and is responded to until it is terminated. The system consists of procedures for controlling personnel, facilities, equipment, and communications. It allows for activating emergency response resources in a grade approach depending on the nature and seriousness of the event. At the INTEC, the ICS is implemented as a chain of command operating on three basic levels. They consist of the On-Scene Command Post, the INTEC emergency control center, and the INEEL Emergency Operations Center.

11.4.1.1 On-Scene Command Post. The On-Scene Command Post is a mobile or transient facility (fire engine, incident response team (IRT) van, hazardous material van, etc.) from which the On-Scene Commander (OSC) establishes unified command with facility response units and conducts on-scene operations. The OSC has tactical command at the scene. For fire, hazardous material, and special rescue response this position is filled by the senior officer responding for the INEEL fire department. If the event is primarily a security incident, the senior responding protective force officer will assume this position. In some instances, the IRT leader may function in this position. In all cases, the OSC and the IRT leader (IRTL) establish unified command to direct the response of fire department and IRT personnel. The IRT provides a first response capability to fires, medical emergencies, hazardous materials incidents, and other situations that require an organized emergency response effort.

The project STR and HSO, as well as a designated replacement, will be trained at the First Responder Awareness Level and shall take immediate actions to

- Understand the potential outcomes associated with an emergency when hazardous substances are present
- An understanding of what hazardous substances are and the risks associated with them in an incident
- The ability to recognize the presence of hazardous substances in an emergency
- The ability to identify the hazardous substances if possible
- The roles of a first responder at the awareness level
- The ability to realize and understand the need for additional resources.

11.4.1.2 INTEC Emergency Control Center. The INTEC emergency control center is the second tier of the emergency response line organization and is headed by the EAM. The EAM is responsible for

all emergency response actions within the entire facility, including advising the OSC. The emergency control center is activated for actual or potential emergencies or at the direction of the EAM. Normally the emergency control center is set up in CPP-652. If the emergency control center is activated in response to an event at the project, then the project will send a representative to the emergency control center to advise the EAM.

11.4.1.3 Emergency Operations Center. The Emergency Operations Center is the upper tier of the ERO and is headed by the INEEL emergency director. The emergency director is responsible for overall strategic management and for policy making decisions involving INEEL facilities. Project personnel do not normally provide direct support to the Emergency Operations Center.

11.4.2 Project Personnel Involved in Emergencies

11.4.2.1 Subcontractor Technical Representative. The STR or the HSO is responsible, as the designated project first responder at the awareness level, for initiating all request for emergency services (fire, medical, etc.) and for notifying the facility SS of abnormal or potential abnormal events occurring on the project. The STR, or designee, serves as the project area warden. The STR in this capacity will report the accountability for all employees when an emergency evacuation is called to the personnel accountability leader. Additionally, the STR will control the scene at the first responder awareness level until relieved by a higher-tiered incident command system (ICS) authority arrives at the scene to take control of the situation as the OSC (see Section 11.4.1.1 of this HASP). While maintaining control of the scene, from a protected, controlled distance, the STR shall maintain communication with the facility SS or the EAM when the system is in place.

11.4.2.2 Project Personnel. Every person at the project has a role to play during an event or INEEL emergency. Each employee must be constantly aware of potential problems or unexpectedly hazardous situations by immediately reporting these situations to the STR or HSO. All employees are expected to watch out for their fellow workers, to report their concerns to the STR, and to respond to emergency events as provided for in the HASP. Specific project personnel responsibilities are outlined in Table 11-2.

11.5 Emergencies, Recognition of Warnings, and Response

11.5.1 Emergency Recognition and Response

All project personnel should be constantly alert for signs of potentially hazardous situations including signs and symptoms of chemical or radiological exposures or releases. Project personnel will be trained on the methods, signals, and alarms used to convey "EVACUATION" and "TAKE COVER," and on immediate response actions. These immediate response actions include

- For an evacuation of the project, project personnel will assemble at designated INTEC locations. Personnel accountability will be performed at this location.
- For a take cover at the project, project personnel will take cover in the nearest enclosed facility.
- For an evacuation or a take cover at INTEC, project personnel will follow INTEC evacuation or take-cover procedures.

Table 11-2. Responsibilities during an emergency.

Responsible Person	Action assigned
HSO or STR	Contact the INEEL site emergency telephone number or the Warning Communication Center
HSO or STR	Signal evacuation or take-cover
HSO, STR, PE or IH (if qualified)	Provide first aid
HSO	Report occupational injuries/illnesses to the Occupational Medical Program
HSO, STR, PE or IH (if qualified)	Extinguish fires (incipient fires only)
HSO or STR	Report incipient fires to the INEEL fire department
IH	Contain spills (within level of training)
IH	Report spills to the INEEL Spill Notification Team
HSO, STR, PE	Assemble Industrial Safety/Industrial Hygiene/Radiological Control team
STR	Contact the INTEC plant shift manager/EAM

- For assistance from the INEEL fire department, project personnel will use radio frequency kid 240 or will call 777, which is the INEEL site emergency telephone number, or 526-1515, which is the warning communication center.
- At least two persons with current medic/first aid training will be present at the project to render first aid. For serious injury, assistance from the INEEL fire department will be summoned. All occupational injuries/illnesses will be reported promptly to the INEEL Occupational Medical Program at 526-1596.
- For incipient fires, project personnel will use assistance from the INEEL fire. All fires of any size will be reported promptly to the INEEL fire department.
- For spills of hazardous/radiological material, project personnel will not expose themselves to hazardous conditions beyond their training and qualification for HAZWOPER. If abnormal radiological situations are present, then the INEEL *Radiological Control Manual* shall be followed. For large spills, assistance from the INEEL fire department will be summoned. All spills will be reported promptly to the INEEL Spill Notification Team at pager #6400.
- If spills are small enough to be safely contained at the project, spill control will be handled by project personnel, who will take the following immediate spill response actions:
 - Untrained project personnel (or if the material characteristics are unknown) shall:
 - Evacuate and isolate the immediate area
 - Seek help from and warn others in the area

- Notify the STR and the HSO.
- Trained project first responders at the awareness level shall:
 - Seek help from and warn others in the area
 - Stop the spill, if it can be done without risk (e.g., return the container to the upright position, close valve, shut off power)
 - Provide pertinent information to the STR and the HSO
 - Secure any ventilation paths and ensure that an RCT surveys the area to determine the extent of a radiological material spill and/or IH surveys the area to determine the extent of a chemical spill.

The nearest INEEL fire station is located at CFA. Fire department personnel have response capabilities for first aid, medical emergencies, transport, fires, and hazardous material spills. Figure 11-1 shows the route to the nearest medical facility, which is located within the INTEC. Figure 11-2 shows the location of the nearest fire station, which is located at CFA. Figure 11-3 shows the evacuation routes for the INTEC facility.

Responsibilities during an emergency at the project are as shown in Table 11-2 of this HASP.

Note: *Results of the drill will be shared with the INTEC ESH&QA manager, or emergency preparedness designee, as well as being coordinated with them.*

11.5.2 Alarms

Alarms and signals are used at INTEC and the INEEL to notify personnel of abnormal conditions that require a specific response. Responses to these alarms are addressed in the general employee training. In addition to the alarms previously described, emergency sirens located throughout the INTEC serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. Actions to be taken by project personnel in response to TAKE COVER and EVACUATION alarms are described next.

11.5.2.1 Take Cover. Radiation or hazardous material releases, weather conditions, or other event or emergency conditions may require that all personnel take cover indoors in the nearest building. A TAKE COVER protective action may be initiated as part of a broader response to an emergency situation and may precede an evacuation order. The order to TAKE COVER is usually announced by activating the INTEC emergency siren. The signal to take cover is a CONTINUOUS SIREN that can be heard throughout the INTEC site area. Remember, STEADY = STAY. But, the order to take cover can also be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER project personnel shall place the project in a safe condition (as appropriate) and then seek shelter in the nearest available building. Vehicles may be used for shelter if there are no buildings nearby. Eating, drinking, and smoking are not permitted during TAKE COVER conditions.

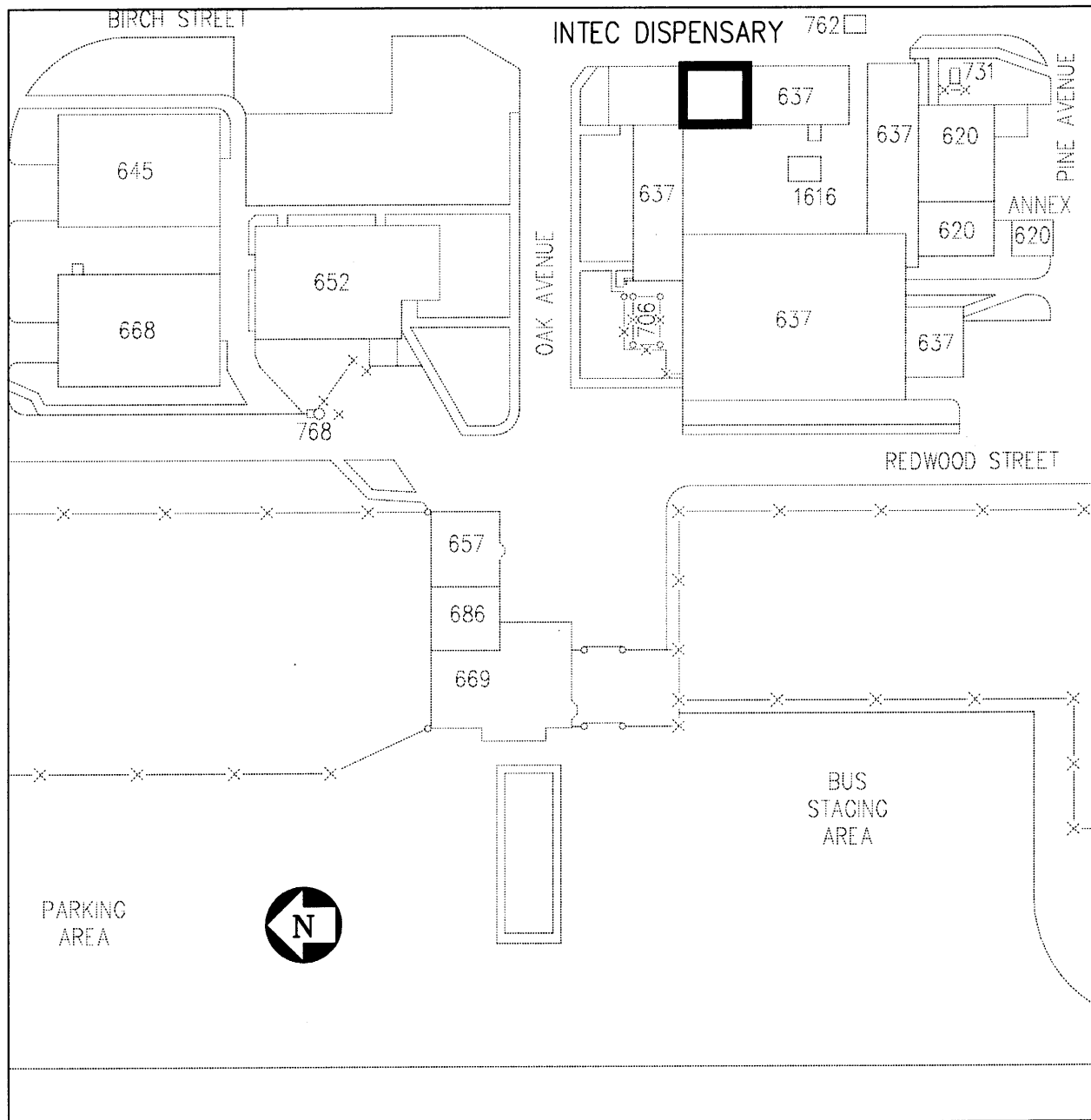


Figure 11-1. Map showing the route to the nearest medical facility location within the INTEC.

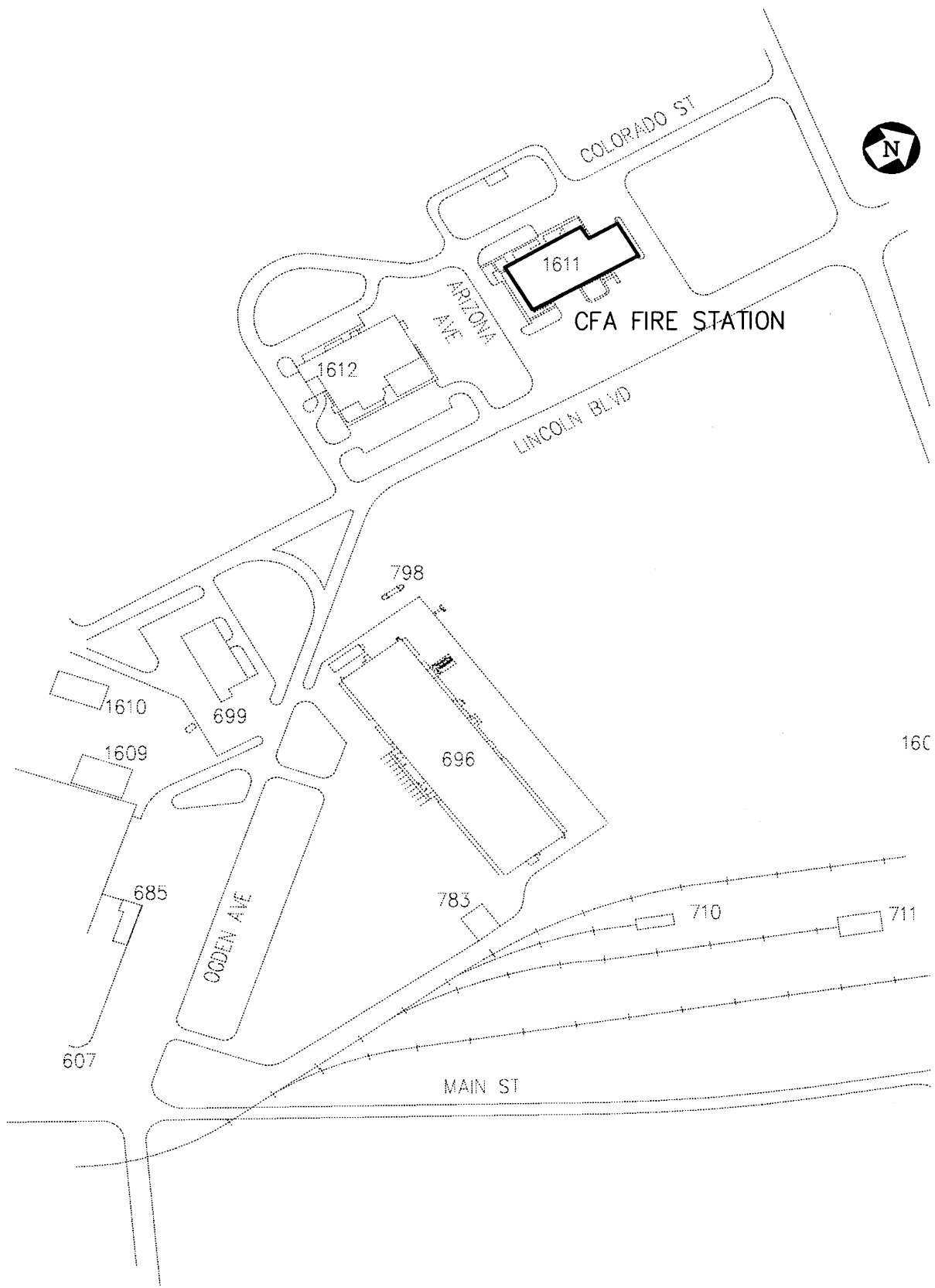


Figure 11-2. Location of the nearest fire station.

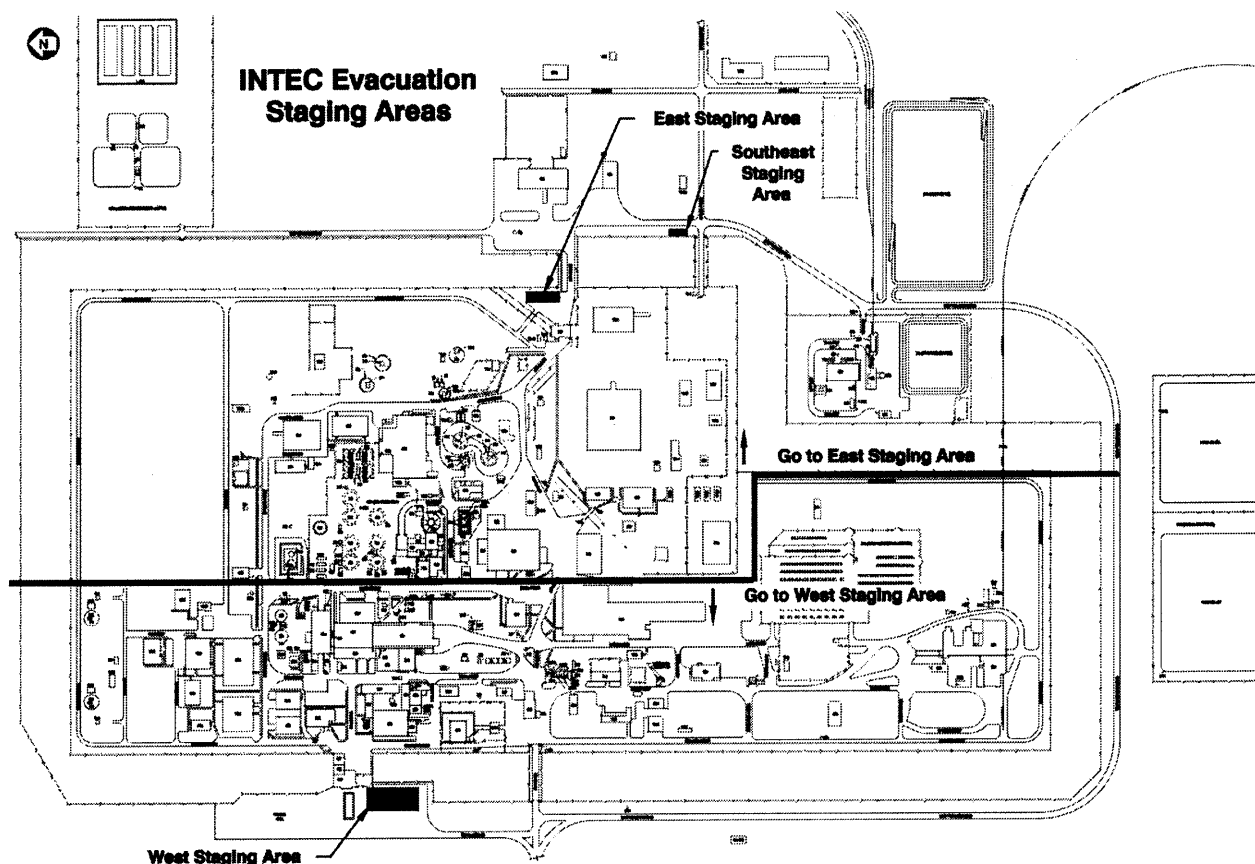


Figure 11-3. Evacuation routes for the INTEC facility.

Project RAdCon, IH, and HSO personnel will assist and direct all workers exiting from radiological contamination areas during an evacuation alarm.

11.5.2.2 Total Area Evacuation. A total area evacuation is the complete withdrawal of personnel from the project and the entire WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action area. The evacuation signal is an ALTERNATING SIREN that can be heard throughout the INTEC. Remember, ALTERNATE = EVACUATE. A single long blast of the air horn serves as the project's alternate emergency evacuation alarm. But, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to EVACUATE project personnel shall place the project in a safe condition (as appropriate) and then proceed along the specified evacuation route to the designated assembly area, or as directed by the EAM. Eating, drinking, and smoking are not permitted during emergency evacuations.

Project RadCon, IH, and HSO personnel will assist and direct all workers exiting from radiological contamination areas during an EVACUATION alarm.

11.5.2.3 Local Area Evacuation. A local area evacuation is the complete withdrawal of personnel from the project, but it does not require the complete evacuation of the entire INTEC area. The order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to evacuate the local area project personnel shall place the project in a safe condition (as appropriate) and then proceed along the specified evacuation route to the assembly area designated for local area evacuations,

or as directed by the STR. Eating, drinking, and smoking are not permitted during emergency evacuations.

Project RadCon, IH, and HSO personnel will assist and direct all workers exiting from radiological contamination areas during an evacuation alarm.

11.5.3 Personnel Accountability/Area Warden

Project personnel are required to evacuate the project in response to TAKE COVER, EVACUATION, and local evacuation alarms. In each case the project area warden shall account for the people present on the project at the time the alarm was initiated. The STR or designee serves as the area warden for the project and completes the personnel accountability based on the sign-in roster used to control project access. As described next, the method used to report the results of the accountability process varies depending on the nature of the emergency event.

For total area evacuations, the INTEC emergency control center is activated and all personnel will gather at the evacuation assembly area designated by the EAM. In this situation the project area warden reports the result of the accountability process to the INTEC area warden coordinator.

The INTEC emergency control center is also activated for TAKE COVER alarms; however, personnel remain in the closest appropriate shelter. In this situation a complete personnel accountability report is not required, but the project area warden should report the result of the accountability process to the INTEC emergency control center (or the plant SS) for the information of the EAM.

The INTEC emergency control center may not be activated for a project local area evacuation. In this situation a complete personnel accountability report is not required, but the project area warden should report the result of the accountability process to the INTEC plant SS for the information of the INTEC plant facility manager.

11.5.4 Notifications

As directed by the office of the Secretary of Energy, the INTEC area director is responsible for immediately notifying the DOE and local off-Site agencies of all significant abnormal events that occur at the INTEC. This duty is in addition to the notification requirements established in the INEEL procedures for events that are categorized as emergencies or unusual occurrences. For this reason the project shall immediately report all abnormal events that occur on the project to the INTEC plant SS and to the WCC. The WCC will in turn notify the appropriate INEEL emergency response resources and other INEEL facilities as appropriate. The INTEC plant SS and the WCC share the responsibility for notifying the INTEC facility manager, EAM, and area director, as appropriate. Normally, the STR is responsible for making the event notifications described above. The STR may make additional notifications as listed in Section 11.8 of this HASP at the discretion of project supervision.

The EAM is the single point of contact between the project and the INEEL ERO and off-Site (off-INEEL) people or agencies. The EAM will make all off-Site notifications and all media requests concerned. The STR will make all project notifications which include notifying the EAM (see Table 11-3).

Table 11-3. Project notification responsibilities.

Activity	Title	Phone	Pager	Radio
Subcontractor Technical Representative				
Notifies	Fire department	777		KID 240
Notifies	Warning Communication Center (WCC)	6-1515		KID 240
Notifies	INTEC plant shift supervisor/ EAM	6-3100	2099	6-Net
Notifies	For spills: Environmental Affairs Spill Team		6400	
Notifies	ER WAG 3 SH&Q Point of Contact	6-3658		
Notifies	ER WAG 3 manager	6-5020	7658	
Notifies	INTEC DOE-ID facility representative	6-5558	6901	
WAG 3 Manager				
Notifies	ER director	6-1559	5013	
Notifies	ER SH&QA manager	6-9956	5689	

11.5.5 Evacuation Routes

The INTEC maintains primary and secondary evacuation routes. These routes may be used in response to a total INTEC area evacuation as directed by the EAM. Copies of the evacuation routes shall be posted at the project and in the project offices.

The project area evacuation plan and INTEC evacuation assembly areas are shown in Figure 11-3. In the event that the project is evacuated (but not the entire INTEC area) personnel shall assemble in the appropriate facility evacuation area or as directed by the STR. If a total area evacuation of the INTEC is ordered then project personnel shall relocate to the primary evacuation assembly area INTEC action or as directed by the EAM.

11.6 Reentry and Recovery

11.6.1 Reentry

During an emergency response it is sometimes necessary to reenter the scene of the event. Reasons for performing reentry may include the following:

- Personnel search and rescues
- Medical first aid responses
- Safe shutdown actions
- Mitigating actions
- Evaluate and prepare damage reports
- Radiation and/or hazardous material surveys.

Re-entries shall be carefully planned to ensure that personnel are protected from harm, and to prevent initiating another emergency event. Reentry planning is undertaken as a graded approach depending on the nature of the initiating event.

11.6.2 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of assessing post-event/emergency conditions and developing a plan for returning to pre-event/emergency conditions when possible and following the plan to completion. The EAM is responsible for determining when an emergency situation is sufficiently stable to terminate the emergency and enter the recovery phase. The WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action facility manager will appoint the recovery manager.

11.7 Critique of Response and Follow-up

A review and critique will be conducted following all emergency events, drills, and exercises at INEEL. In some cases an investigation may be required prior to commencing recovery actions. For this reason care should be exercised to preserve evidence when appropriate.

11.8 Telephone/Radio Contact Reference List

Table 11-4 lists the points of contact for the project. This list will be posted at the entrance to the contamination reduction corridor and in project offices.

11.9 WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action Notification Responsibilities

Table 11-5 is the reference list that will be posted at each support zone and to the offices of those assigned notification responsibilities.

Table 11-4. Project emergency contact list.

Contact Title	Contact Name	Phone Number/ Radio Net	Pager Number
Warning Communications Center (WCC)		777, 6-1515, KID-240"	
INTEC plant shift supervisor		6-3100	
INTEC facility manager	M. Stubblefield	6-3010	5432
INTEC site area director	A. Clark	6-6334	7957
First Aid (CFA Medical Dispensary, CFA-1612)		777, 6-2356	
Occupational Medical Program		6-1596	
Fire/Security		777	
Project manager	R.L. Davison	6-3770	5744
Subcontractor technical representative	J. Landis	6-6311	6792
INTEC Project HSO	S. A. Hicks	6-7080	6851
Radiological control engineer	TBD		
ER industrial hygiene	M. T. Langlois	6-0127	9042
Subcontractor job site supervisor (JSS)	TBD		
ER WAG 3 SH&Q POC	L. McManamon	6-3658	
ER environmental compliance officer	K. Davis	6-4949	7833
INTEC industrial hygiene	J. D. Downes	6-3233	5514
ER SH&QA manager	C. R. Chebul	6-9566	5689
INTEC ESH&QA manager	L. Reed	6-6925	4412
INTEC DOE-ID facility representative	T. W. Jenkins	6-4978	

Table 11-5. WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action notification responsibilities.

Responsible Person or Organization		Phone	Pager	Radio
STR notifies	INEEL Emergency Response Telephone Number	777	—	KOK 130
HSO notifies	Warning Communication Center (WCC)	526-1515	—	KID 240
HSO notifies	INEEL Spill Notification Team for spills	—	6400	—
HSO notifies	INEEL Occupational Medical Program, for occupational illness or injury	526-1596	—	—
STR notifies	INTEC plant shift supervisor/EAM	526-3100	—	—
STR notifies	INTEC site area director/landlord	526-6334	7957	—
STR notifies	ER WAG 3 SH&Q POC	526-3658	—	—
STR notifies	ER environmental compliance officer	526-4949	7833	—
STR notifies	Project manager	526-4530	5386	—
PM notifies	INTEC DOE facility representative	526-4978	—	—
PM notifies	ER SH&QA manager	526-9956	5689	—

12. REFERENCES

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- American Conference of Governmental Industrial Hygienist, *Threshold Limit Values Booklet*, 1997-1998, edition.
- COCA, 1987, *Consent Order and Compliance Agreement*, Resource Conservation and Recovery Act, Section 3008(h), U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency Region 10, and U.S. Geological Survey, August.
- Code of Federal Regulations, Title 29, Part 1910, *Occupational Safety and Health Standards for General Industry*.
- Code of Federal Regulations, Title 29, Part 1910, *Occupational Safety and Health Standards for General Industry*.
- Code of Federal Regulations, Title 29, Part 1926, *Occupational Safety and Health Standards for the Construction Industry*.
- Code of Federal Regulations, Title 40, Parts 260 through 281, EPA Implementing Regulations for RCRA.
- DOE Standard, *EM Health and Safety Plan Guidelines*, DOE-EM-STD-5503-94, SAFT, February, 1994.
- DOE Standard, *U.S. Department of Energy Hoisting and Rigging*, June 1995, DOE-STD-1090-96, *DOE Handbook, Hoisting and Rigging*, 1996.
- DOE, 1995, *DOE Handbook*, "Hoisting and Rigging," U.S. Department of Energy, June.
- DOE-ID, 1991, *Federal Facility Agreement and Consent Order Action Plan*, U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency Region 10, State of Idaho Department of Health and Welfare.
- DOE-ID, 1997, *Idaho National Engineering and Environmental Laboratory Reusable, Recyclable Materials, and Waste Acceptance Criteria*, DOE-ID-10381, Latest Revision.
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- INEEL, 1995, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, and 10*, INEL-95/0086, current issue.
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INEEL, 1997b, *INEL Emergency Plan/RCRA Contingency Plan*, Lockheed Martin Idaho Technologies Company, PLN—114, October.

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INEEL, *Management Control Procedures: Environmental Restoration Program*, current issue.

INEEL, Manual #14A: *Occupational Safety and Fire Prevention*, current issue.

INEEL, Manual #14B: *Industrial Hygiene and Fire Safety*, current issue.

INEEL, Manual #15A: *INEEL Radiological Controls Manual*, current issue

INEEL, Manual #15B: *Radiation Protection Manual*, current issue.

INEEL, Manual #15C: *Radiation Protection Manual*, current issue.

INEEL, Manual #16: *INEEL Emergency Plan/RCRA Contingency Plan*, current issue.

INEEL, Manual #6: *Facilities, Utilities, and Maintenance*, current issue.

INEEL, Manual #8: *Environmental Management*, current issue.

INEEL, Manual #9: *Operations*, current issue.

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NIOSH, 1985, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institutional of Occupational Safety and Health/Occupational Safety and Health Administration/United States Coast Guard/U.S. Environmental Protection Agency, DHHS (NIOSH) Publication No. 85-115, October.

Appendix A

WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action Health and Safety Plan Training Acknowledgement

Instructions to complete Training Form-361.02

The Form 361.02 training Attendance Roster goes here. Writer to follow the below instructions.

The training roster must be completed in the following manner as part of the issued HASP:

1. The Course Number is ER HASP 00 (this number has been decided by the Training Directorate for input into the TRAIN system) and should be already in the box.
2. Revision is 0.
3. Course Title is: Health and Safety Plan Acknowledgement, Class Title: (Insert name and number of the project here). This box needs to be completed at the time of the writing of the HASP.
4. The remarks section is already completed.

[illegible]

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Course Number ER HASP 99	Revision 0	Course Title Health and Safety Plan HAZWOPER Project Specific training Form Class Title: WAG 3, OU 3-13, Group 1 Soils Tank Farm Interim Action project						Starting Date / Time					
Instructor's S#	Instructor's Name	Instructor's Signature				Instructor initial each day's class attendance							

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